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Annual of the universal medical sciences and analytical index

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ANNUAL

OF THE

UNIVERSAL MEDICAL SCIENCES

A YEARLY REPORT OF THE PROGRESS OF THE GENERAL
SANITARY SCIENCES THROUGHOUT THE WORLD.

EDITED BY

CHARLES E. SAJOUS, M.D.,

AND

SEVENTY ASSOCIATE EDITORS,

ASSISTED BY

OVER TWO HUNDRED CORRESPONDING EDITORS, COLLABORATORS,
AND CORRESPONDENTS.

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TABLE OF CONTENTS OF VOLUME FOURTH.

Diseases of the Skin and Syphilis, ... Section A

By ARTHUR VAN HARLINGEN, M.D.,
PHILADELPHIA.

Ophthalmology, ... Section B

By CHARLES A. OLIVER, A.M., M.D.,
PHILADELPHIA,
Ophthalmic Surgeon to St. Mary's and St. Agnes' Hospitals,
AND
GEORGE M. GOULD, M.D.,
PHILADELPHIA,
Ophthalmologist to the Philadelphia Hospital.

Otology, ... Section C

By CHARLES S. TURNBULL, M.D., Ph.D.,
PHILADELPHIA,
Aural Surgeon to the German, Jewish, and St. Christopher Hospitals, etc.,
AND
ARTHUR AMES BLISS, M.D.,
PHILADELPHIA.

Diseases of the Nose and Accessory Cavities, . Section D

By CHARLES E. SAJOUS, M.D.,
PHILADELPHIA.

Diseases of the Pharynx, Tonsils, and Soft Palate, ... Section E

By D. BRYSON DELAVAN, M.D.,
NEW YORK,
Professor of Laryngology and Rhinology in the New York Polyclinic, etc.

Diseases of the Larynx, Trachea, and Œsophagus, Section F

By J. SOLIS-COHEN, M.D.,
PHILADELPHIA,
Honorary Professor of Laryngology in Jefferson Medical College.

Intubation of the Larynx, ... Section G

By E. FLETCHER INGALS, A.M., M.D.,
CHICAGO,
Professor of Laryngology in Rush Medical College; Professor of Diseases of the Throat and Chest in the Woman's Medical College.

DISEASES OF THE THYROID GLAND, ... Section H

By FRANKLIN H. HOOPER, M.D.,
AND
J. PAYSON CLARK, M.D.,
BOSTON.

INEBRIETY, MORPHINISM, AND KINDRED DISEASES, . Section I

By W. R. BIRDSALL, M.D.,
NEW YORK,
Physician to the Department for Diseases of the Nervous System of the Manhattan Eye and Ear Hospital, New York.

LEGAL MEDICINE, ... Section J

By FRANK WINTHROP DRAPER, A.M., M.D.,
BOSTON,
Professor of Legal Medicine in Harvard Medical School, etc.

URINALYSIS, ... Section K

By ALLEN J. SMITH, M.D.
Demonstrator of Pathological Histology and Morbid Anatomy and Lecturer upon Pathology of Urinary Diseases in the University of Pennsylvania.

BACTERIOLOGY, ... Section L

By HAROLD C. ERNST, A.M., M.D.,
BOSTON,
Demonstrator of Bacteriology, Harvard University Medical Department.

EPIDEMIOLOGY, ... Section M

By JOHN B. HAMILTON, M.D.,
WASHINGTON,
Supervising Surgeon-General of the U. S. Marine Hospital Service.

VOLUME INDEX, ... Section N

DISEASES OF THE SKIN.

By ARTHUR VAN HARLINGEN, M.D.,
PHILADELPHIA.

SIMPLE INFLAMMATORY PROCESSES.

Erythema with Icterus.—Muselier[55, Dec.1,'88] reports the case of a woman of 28, without rheumatic history, who, after a brief prodromal period of lassitude, etc., had a chill, followed by headache and fever. Four days before examination, and about three days after the commencement of the fever, the patient had observed an eruption on the lower limbs, which became quickly generalized. On examination, the face and neck were uniformly red, while the chest and abdomen were covered with diffuse lentil-sized, flat, bright-red papules, confluent or touching at their borders at nearly all points. The back was uniformly red. The limbs were covered with palm-sized, circinate, irregular, intersecting lesions, slightly itching. The fever had nearly subsided. No mouth or throat lesions. At the end of four days the eruption had faded, but icterus from retention began and lasted a week, when the patient recovered. A somewhat similar but fatal case was reported by Féréol.[863, 174] His patient had rheumatism with cardiac troubles.

Blennorrhagic Erythema.—Dubreuilh[780, July] says that erythematous and erythemato-papular eruptions have long been observed in the course of blennorrhagia, but, as patients are usually under the influence of copaiba, the eruption has usually been charged to the credit of that drug. Now that blennorrhagia is known to be an infectious disease the germs of which may become diffused throughout the system, not only arthritis, but also iritis, endocarditis, and skin eruptions have been traced to this cause. These eruptions resemble those found in other infectious diseases, as pyæmia, diphtheria, typhoid fever, cholera, etc. Dubreuilh reports an example of the following case of blennorrhagic eruption:—

A boy of 19 had suffered fifteen days with a moderate blennorrhagia, commencing two days after a suspicious connection. He had taken lead injections, but no other treatment. A week previous to examination a papular eruption had appeared, at first on the face and right hand, accompanied by slight headache. Later, the left hand had become affected. On examination, the patient was found suffering from general bronchitis, an abundant urethral discharge, and an eruption of millet-seed-sized, discrete, and confluent papules, of a deep-red color, surrounded by an erythematous areola, with a light point in the centre, simulating in some instances a vesicle. The eruption was very profuse on the face, and was also seated on the backs of both hands. The eruption faded away within a fortnight of its first appearance.

Erythema Multiforme.—Schoetz,$^{4}_{\text{July},8}$ describes a case of this affection involving the air-passages. A man of 40 was suddenly attacked with sore throat, profuse salivation, and high fever, with headache and rheumatic pains in the joints. On examination, general redness of the oral cavity and pharynx was observed. A quarter-dollar- (groschen) sized, flat ulcer, with a grayish-yellow base and ill-defined edges, was seated on the posterior wall of the pharynx, while a number of small aphthoid ulcers were scattered along the edge of the gums, within and without. The laryngeal mucous membrane was very red and somewhat diffusely swollen, and one or two flat ulcerative lesions were found on its posterior border. Later, similar lesions appeared within the nasal passages and on the tonsil. Within the next few days the articular pains continued and a characteristic eruption of erythema multiforme developed, at first over the backs of the hands and feet, which later spread to various parts of the body, including the scrotum and prepuce, while various joints, as fingers, wrists, etc., became swollen and painful. Deep mental depression characterized the attack. The urine was normal. The patient began to recover in about three weeks, and at the end of a month was well; but a few days subsequently a relapse occurred, with high fever, etc., when nearly all the mucous membranes were affected. The fever disappeared slowly, but new lesions came out from time to time for six months following.

Scabies—Anatomy.—Török$^{28}_{\text{v.3,No.8}}$ has examined the cuniculi, and has come to the conclusion that the acarus does not inhabit the prickly layer, but the undermost part of the middle layer of the epidermis; further, that the eczema of scabies is not caused by scratching, but by irritating substances given off by the acarus.

Acne.—Pick[45 H.4] gives the history of 2 cases of this affection, indicating that there are two morbid processes under the same name. In one the lesions are at first small, reddish-brown, slightly-elevated papules, pin-head size, rising sharply from the surrounding skin and disappearing gradually or slowly, and slightly enlarging. After a time a small central crust forms, and the papule assumes an umbilicated appearance. The crust remains until cicatrization has taken place. There is usually very little suppuration, but when this occurs there is a slight collection of a yellow, purulent fluid around the crust, with an inflammatory zone. A deeper scar results in this case. The other form, described by Boech as *acne necrotica*, is characterized by the appearance of hæmorrhagic points, which, by confluence, form small violet maculæ. The epidermis becomes thickened and œdematous, and the subsequent destruction of the skin is greater and deeper.

(The first of these varieties was observed, and I think described, some years ago, by Duhring and myself, under the name of "small papular scrofuloderm.")

The Therapeutics of Acne Disseminata.—Louis Heitzmann, of New York,[150 Sept.] after mentioning the usual well-known internal remedies employed in the treatment of acne, says that local treatment is of great value, and is to be employed in three grades or forms, according as (1) the acne is complicated with seborrhœa; (2) the comedones are small and insignificant, with numerous acne papules and few pustules; or (3) the acne is pre-eminently pustular, each pustule surrounded with hard infiltration, and the comedones numerous and deeply seated. In the first class of cases sulphur is particularly useful in the form of the well-known "Vlemingckx's solution" (10 parts quicklime and 20 parts precipitated sulphur, boiled down in a glass vessel with 200 parts water until 120 parts remain, and then filtered); when used, this is diluted with 9 parts of water. The rotten-egg smell which is characteristic of the solution disappears when it dries upon the face. This solution should be dabbed on the affected parts every evening after the comedones have been, as far as possible, squeezed out. Every three to six days the strength of the solution is to be increased. If the skin becomes irritated cold cream should be applied.

American dermatologists are fond of using the following:

℞ Potas. sulphuret., zinci. sulphat., āā ʒj (4 grammes); aquæ rosæ, ℥iv (124 grammes).—M. This Heitzmann thinks is useful in mild cases. He also recommends a 6- to 10-per-cent. sulphur ointment. In the second form of acne, he recommends the use of soap well rubbed in at night, beginning with castile, and using in severe cases one of the stronger soaps, or a sand or marble soap. The comedones should be removed by using a curette or watch-key, or one of the various comedo-pressers. In severe cases, sapo viridis may be rubbed in after the extraction of the comedones. A solution of soap (℞ Sap. vir. Germ., ℥j (31 grammes); alcohol. fort., f℥ij (62 grammes); aquæ, f℥iij (93 grammes); sp. lavandulæ, f℥ss (15.5 grammes).—M.) may be employed by rubbing in and leaving on the surface overnight, removing next morning with castile soap. In severer forms of papular acne, Heitzmann suggests the following: ℞ β-naphthol, ʒiiss (9 grammes); sulphur. præcip., ʒxiiss (47 grammes); vaselin (*vel* lanolin), saponis viridis, āā ʒvss (21 grammes).—M. This paste causes scaliness of the skin after a few days, but is not so irritating as some other applications. It should be smeared on at night and allowed to remain for fifteen to twenty minutes; then gently removed by pieces of cotton dipped in olive-oil, and finally washed off with castile soap and hot water. Two or three operations are generally as much as the skin will bear, and cold cream must then be used until the peeling of the skin has ceased.

Recently, a 10-per-cent. resorcin paste has been used with the same end in view, and in the milder forms a paste of 3-per-cent. resorcin and 6-per-cent. sulphur. The advantage of using pastes is that the comedones become soft and more easily removable. In the third form of acne—the so-called "acne indurata pustulosa"—the indication is to empty the abscesses, either by squeezing the smaller ones between the thumb-nails or by opening the larger ones with a small bistoury, the slight resulting hæmorrhage being stayed by small pledgets of styptic cotton. When small cysts are present, a pointed stick, dipped in solution of the perchloride of iron, may be inserted into the openings as a cautery and germicide. A 5-per-cent. carbolic-acid solution may subsequently be rubbed over the skin with greased rags as a disinfectant. In the subsequent treatment of this form of acne a 3-per-cent. alcoholic solution of salicylic acid may be employed. At first this is to be mixed with 3 parts of water, rubbed in every evening with a piece of flannel, the solution being gradually made stronger and stronger until it is used pure. This solution softens the sebaceous plugs and also acts as a parasiticide. Heitzmann is opposed to the use of the sharp spoon, but speaks in favor of the acne-lancet or other means of emptying any purulent accumulations. The pigment patches which follow this form of acne may be removed by the application of the following ointment: ℞ Hydrarg. ammoniat., ʒj (4 grammes); bismuth. subnitrat., ʒj (4 grammes); ung. aq. rosæ, ℥j (31 grammes). —M. In order to remove the resulting scars Heitzmann recommends Bulkley's method,—the administration of *oleum ricini*, in doses of 4 drops gradually increased to 30 drops, thrice daily. If the oil agrees with the patient and is digested, it gradually brings a deposit of fat into the subcutaneous tissues, and thus causes the disappearance of the scars. I am inclined to doubt if this method will prove generally successful, and would advise its employment without too sanguine hopes of perfect success.

Sycosis.—Our correspondent, A. Ducrey, of Naples, says that Tomasoli has described, under the name of "sycosis bacillogena," a form of sycosis of the beard in which he has succeeded in isolating an elliptic-form bacillus, 1.0 to 1.8 μ by 0.3 μ, growing readily but slowly at ordinary temperatures on all common cultures, and staining readily with the anilin processes. He calls it bacillus sycosiferus fœtidus. This form of sycosis differs from the ordinary form in its diffuse dark-redness. Inflammatory nodules are absent.

ANGIO-NEUROTIC DERMATOSES.

Urticaria, Capillary Pulse in the Lesions of.—Hirtz[3, Jan.30] says that by lightly pressing the skin above and below the urticarial lesion the capillary pulse can be observed. As it is the consequence of vasomotor paralysis, this phenomenon confirms the views of Renaut, of Lyons, who attributes the round lesions of urticaria to atony of an arteriole dominating a particular vascular cone. Hirtz asserts that this symptom has a diagnostic value, as he has not found it in simple erythema nor in the eruptive fevers. Du Castel, however, says that he has in one case noted the capillary pulse around the papules of variola as a temporary symptom, while Beurman has observed it in the neighborhood of the patches of erythema multiforme.

Nilot,[24 June 2] says that there are two varieties of chronic urticaria: the gastro-intestinal, which is cured by regimen, with the employment of alkalies; the other, described by Hardy as of nervous origin, and curable by nervines, particularly by antipyrin. Four cases of the latter form have been successfully treated by Nilot, the dose of antipyrin given having averaged 8 grains (0.5 gramme) daily, continued for some time.

Urticaria Pigmentosa.—Dubois-Havenith[276 May 30] remarks that most cases of this affection have been reported as occurring in infants and young children; in fact, Raymond's 29 reported cases all began in the earliest months of infancy. The chief lesions are circinate papules and pigmented patches of tubercles or macules of a brown color. He now reports an adult case. The patient, a woman of 40 years, had had factitious urticaria for five years. For two years past she had had very numerous and persistent pigmentary macules on the arms, legs, and trunk. When rubbed, elevations appeared around these macules, which then assumed a reddish color. Havenith alludes to several similar reported cases.

Dermatitis Herpetiformis.—Blaschko[4 Feb. 11] has used arsenic with good effect in 2 cases of dermatitis herpetiformis, and urges its employment in this affection. Brocq employs ergotin and hydrobromate of quinine, 4 to 8 grains (0.25 to 0.5 gramme) daily of each.

Dubreuilh[108 Mar. 1] uses 16 grains (1 gramme) ergot, with $\frac{8}{10}$ grain (0.05 gramme) extract of belladonna, daily, with success. He has also found Fowler's solution useful. The general treatment, Dubreuilh says, must include calmatives, as valerian, asafœtida, and bromide of potassium, with external applications containing carbolic acid, chloroform, etc. Ointments of bichloride of mercury, together with some narcotic, as hyoscyamus, belladonna, morphia, or cocaine, may also be employed. In Dubreuilh's experience most relief has been gained by lotions of chloroform-water, followed by dusting with powdered talc and inunction with a calomel-and-belladonna ointment. In severe cases narcotics must be used, and, if the eruption assumes a pemphigoid character, a powder of talc with thymol may be used as a disinfectant.

NEURITIC DERMATOSES.

Herpes Zoster.—At the last annual meeting of the American Dermatological Association, Greenough[1 Oct. 15] read some clinical notes on herpes zoster, comprising statistics drawn from a series of 235 cases. Forty-five per cent. were males; most cases occurred between the ages of 10 and 15. The greater proportion of cases occurred in the spring months. In most cases the sensitive fibres of the nerves alone were affected, but 2 cases of marked facial paralysis came under notice accompanying herpes zoster of the face or head. There were some cases where it was very difficult to distinguish between the preputial and labial forms of herpes and herpes zoster. Greenough does not think that herpes zoster can be shortened in duration or the eruption aborted. Irritation should be avoided and the vesicles should not be broken. In the discussion which followed, a variety of opinions were expressed. G. H. Fox considered violence an important etiological factor. He considered the constant galvanic current the best form of treatment. Two or three applications might be sufficient to render the patient entirely comfortable, until recovery took place. Robinson considered the disease not strictly a neurosis, but rather an infectious disease like pneumonia. It had a definite duration, and generally appeared but once in a life-time. Zeissler had seen a case of Hodgkin's disease which had been treated by arsenic, when, after the tumors had nearly disappeared, a crop of herpes vesicles had come out in the gluteal and femoral region. He also instanced a case where there had been perfect analgesia over one side of the face, and at the same time a pricking and burning over the same area. Graham (president) mentioned a fatal case where the herpes zoster affected the cheek and lower lid of one side. On the fourth day the pain attacked the other side of the face, and on the fifth day the patient suddenly died. At the autopsy there was found a softened condition of certain parts of the brain. The Gasserian ganglion and a portion of the fifth nerve were found to be inflamed, and leptothrix threads, together with single bacteria, were found in some of the arterioles of the former structure.

Kaposi $^{84}_{\text{No. 25, 26}}$ says that outbreaks of herpes zoster occur every spring and autumn in Vienna. Between November, 1888, and February, 1889, Kaposi saw 40 cases. Though we know the disease to be due to nerve-lesions, we do not yet know in all cases what the cause of the nerve-lesion may be. Kaposi thinks it due to some micro-organism, and considers the disease infectious, like croupous pneumonia. The wave-like prevalence, the dependence of the waves on atmospheric influences, the fact that idiopathic herpes zoster does not attack the same individual twice, and the variation of the type with the epidemics are regarded as favorable to this view. An obvious difficulty to be surmounted is the limitation of the eruption to the district supplied by one nerve. But we may argue here from analogy, and refer to the action of arsenic (*sic*) and carbolic oxide. Leudet, Jr., has repeatedly observed herpes zoster follow poisoning by this gas, and Salter has recently reported a case in which trigeminal neuralgia followed immediately on the poisoning and herpes zoster ophthalmicus four days after.

Kaposi[8 No.10] has also described 2 cases of what he calls, after the concise German manner, "zoster atypicus gangrænosus hystericus." The first case, that of a woman of 27, showed, when first seen, on the eighth day of the disease, on both sides of the chest and upper part of the abdomen, bands and oval patches of green and dark-brown crusts, each group being from about 1 to 3 inches (25 to 75 millimetres) long, and consisting of elements about the size of a lentil-seed. Close inspection showed that the necrosis began under the epidermis. When the crusts separated deep ulcers remained. Vesicles with dark-green, depressed centres could be seen near one group of crusts, and papules and vesicles the size of poppy-seeds were grouped on various parts of the chest. The patient had been subject to similar attacks since the age of 12, and for the last seven years had had one yearly. The eruption was not always confined to the same locality, for the extremities and the face had been affected as well as the chest and abdomen. Scars, some of them keloid-like, marked the site of previous outbreaks. The subject of this second case had a similar eruption. She was a girl of 15, and suffered from complete left anæsthesia. (Kaposi thinks his cases different from Doutrelepont's "spontaneous gangrene," but I am inclined to believe them identical *and factitious.*)

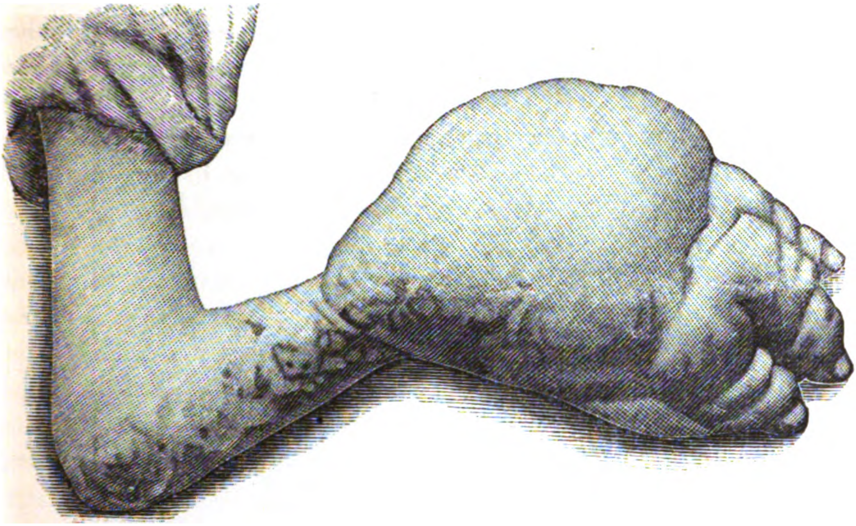
Our collaborator, Byron Bramwell, of London, considers very fully the etiology of herpes zoster,[766] and gives reason for supposing that the disease is due to the penetration of some organic germ into the body. He also directs attention to the occurrence of herpes zoster on the hands and feet. He states that he has succeeded in cultivating several distinct organisms from the fluid of the vesicles. Bramwell, however, concludes that these are the consequences rather than the cause of the disease, and prefers postponing a positive opinion on the subject until he has had an opportunity for further investigations.

Herpes Zoster Ophthalmicus.—Sattler $^{8}_{\text{No.7;}}$ $^{697}_{\text{June}}$ reports a case of this disease occurring in a lad of 15. In this patient the first and second branches of the trigeminus (V) nerve were affected. The primary cause was probably the tuberculous inflammation of the adjacent bones from which the patient was still suffering. Leudet and Barié were the first to call attention to the frequency of herpes in tuberculous patients. A second case, reported at the same time by Sattler, was due to the effects of poisoning by coal-gas. The first symptoms in the patient, a man of 85 years, were neuralgic pains of the first branch of the trigeminus nerve, which were followed on the fourth day by herpes eruption. The naso-ciliary branch was also attacked, as was evident from the ocular disturbance first mentioned by Hutchinson as occurring in conjunction with similar affections. A fortnight later, death having ensued, the necropsy was performed, when, besides an intense bronchitis, it was noted that the median portion of Gasser's ganglion (that part from which the first branch with the frontal and naso-ciliary nerves spring) was infiltrated with inflammatory products situated in its interstitial tissue, and that the ganglion-cells were, to a great extent, destroyed. This degeneration was also very evident in the nerve-bundles arising from the affected ganglion-cells and extended through the ciliary nerves into the eye itself. Cases of herpes eruption after coal-gas poisoning have not infrequently been observed. It is thought by some authors that mycotic thrombosis is the cause.

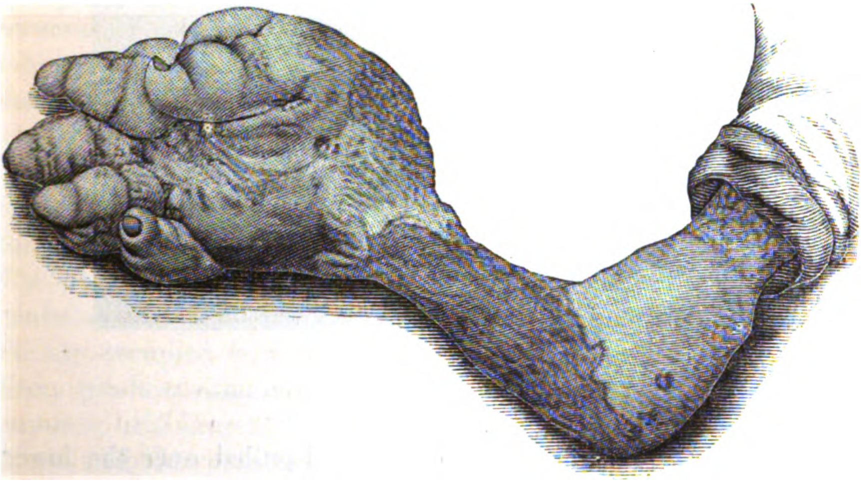
STASIS DERMATOSES.

Elephantiasis.—Bennett $^{272}_{\text{Mar.1}}$ reports two cases of elephantiasis of the face occurring in "Griqua" natives. The first case presented itself in a boy of 18 in the form of a redness and swelling in the face, accompanied by fever and marked constitutional disturbance. It was taken for erysipelas and lasted twenty-one days, leaving a swollen and œdematous condition behind. A month later a recurrence of the fever was observed, with redness and swelling as before, when the disease was recognized as being elephantiasic in character. Fresh attacks followed at varying intervals, exposure to the weather increasing their frequency and severity, and each attack was followed by an increase in the permanent induration and swelling of the face. There was no family history of the disease, no chyluria nor albuminuria. The case was lost sight of. The second case was seen in a more advanced stage. The face and ears were of enormous size, the integument being immensely thickened and formed into hard, rugose masses or folds. The eye was almost disorganized. The disease had begun three years previously as a red spot in the forehead, which gradually increased in size and induration until the whole face was involved, while the patient suffered from attacks of chilliness and high fever. Bennett considers the disease malarial in origin.

Felkin[36 Mar.] reports the case of a woman of 33, a native of India, who had enjoyed fair health, excepting that she "had not been able to walk properly" from childhood up to 32 years of age. She was up to that time remarkably thin, but after a severe attack of fever (she was subject to intermittent fever) she began to increase in size, suffered from loss of appetite, nausea, and vomiting, with headache, and her arms and legs felt heavy and powerless. About this time she came from India to England and came under Dr. Felkin's care. On examination, it was found that a remarkable hypertrophy of the integumentary system had taken place over the whole body, with the exception of the head and neck, the forearms and hands, the legs below the knees and the feet; also the anterior aspect of the trunk from 3 inches below the clavicles to the umbilicus, and the posterior aspect between and underneath the scapula. The affected skin was darkly pigmented, rough like the rind of a boiled orange, tense, and bound down to the subcutaneous tissue in some parts, while in others it was movable. Around the waist it was like a broad girdle, which sank down when the patient was in an erect position, and the masses of hypertrophied tissue which encircled the thighs descended, especially in front, in dewlaps. To the touch, the hypertrophied tissue felt dense, brawny, and slightly elastic. The skin did not pit on pressure. It was slightly painful when touched. The glands in the groins and axillæ were enlarged. Examination of the blood and urine showed absence of lymph. No organisms were found. There was little or no fever. The treatment of this case is of interest. Absolute rest, a daily hot bath, and bland food in moderate amount, consisting chiefly of milk, was ordered. Massage and the constant electric current were employed. Quinine, arsenic, iron, and strychnia were administered, and the bowels were regulated by the frequent administration of aperients. A marked and rapid amelioration of all symptoms was observed, and by the end of ten or twelve weeks the patient's integument had nearly returned to its normal condition. The case was supposed by some to be rather allied to scleroderma than elephantiasis.



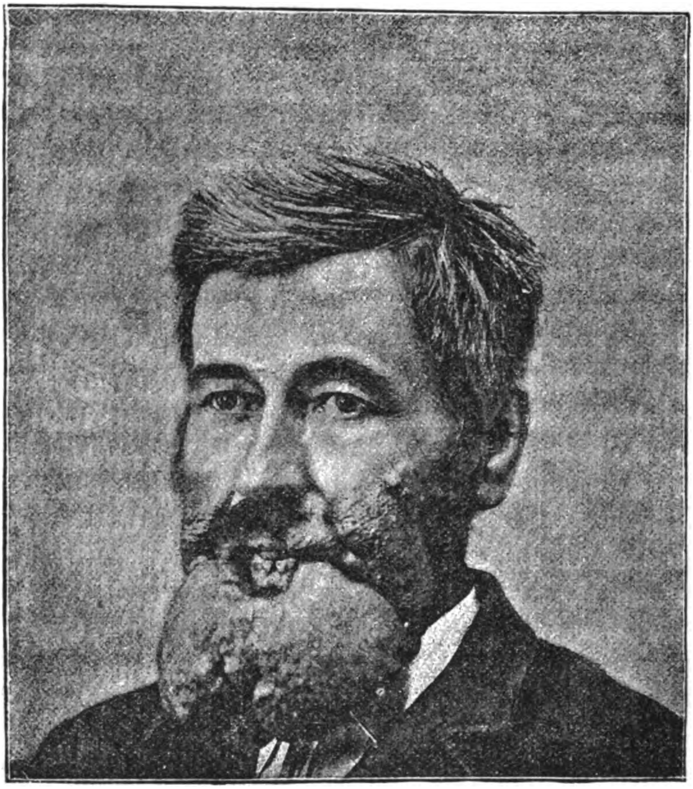
Elephantiasis. (Back of Hand.)
(*Provincial Medical Journal.*)



Elephantiasis. (Palm of Hand.)
(*Provincial Medical Journal.*)

Berry[28 May] describes the case of a man who suffered from elephantiasis of twelve years' gradual growth consequent upon a burn. The arm was amputated. The cuts are here annexed (preceding page) on account of the unusual circumstance of true elephantiasis following such an injury.

Nævoid Elephantiasis.—Merrill Ricketts[245 Apr.] reports the case of a man of 42, showing a "port-wine rash" extending from the level of the alæ nasi and ear, on either side, down to the line of the clavicles. The weight of the growth had pulled over the lower lip so that it could not be perceived; there were very few hairs on the face; the surface was in some places nodulated.



NÆVOID ELEPHANTIASIS.
(*Journal of Cutaneous and Genito-Urinary Diseases.*)

IDEO-NEUROSES.

Pruritus.—Senile pruritus, says Floy,[359 p.26] should be treated by bran- or starch- baths. Every evening the body should be bathed with water heated to 40° C. (104° F.), to which 2 teaspoonfuls of the following mixture should be added: ℞ Acid. carbolic., ʒj (4 grammes); glycerinæ, ℥ij (62 grammes).—M. The surface is then to be powdered with a mixture of 20 parts salicylate of bismuth and 90 parts of starch.

EPIDERMIDOSES.

Ichthyosis of Extreme Severity in an Infant.—Róna[45, ii.] saw an infant 11 months of age who had displayed from the third month brownish-red, shining, scaly patches on the face, which, by the end of the fifth month, had extended to the hands and lower extremities. At times the poorly-nourished little girl showed also circumscribed, symmetrical, yellowish, scaly, shining areas in the face, with similar somewhat infiltrated patches, covered with fissured horny scales, on both sides of the loins, the sacral region, tubera ischii, and posterior aspect of the thighs. Similar, but smaller, patches appeared on the anterior surface of the thighs and on the legs. The feet showed atrophic, sunken skin, with scaliness, and on the hands sharply-defined atrophic patches and thick, fissured, horny lamellæ were seen about the finger-joints. While under observation for eight months these changes progressed until the entire face was shining and atrophic. A brother of the patient showed similar but more-marked symptoms a few days after birth, and died at the end of four months.

Keratosis, or Ichthyosis Follicularis (*Psorospermose Folliculaire Végétante*).—J. C. White, of Boston,[245, June] reports a case where the patient presented the following extraordinary manifestations: The whole surface, with the exception of the palms and soles, the genitals, and some portions of the flexor aspect of the arms, was thickly occupied by a variety of lesions, including small, smooth, firm, pin-head-sized, skin-colored papules; larger, hyperæmic papules; still larger, flattened, hemispherical papules covered with dense, nail-like, polished epidermis of a dark color, some excoriated. In addition, there were extensive patches of disease, formed by the confluence of the above lesions and presenting uneven surfaces, covered by thick, yellowish or brownish, flattened, horny concretions; also elongated, horny masses from ¼ to ⅓ inch (6 to 8 millimetres) in height, of irregular outline, with blunt, truncated apices, yellowish in color, of dense consistence, and compactly crowded;

on removal, the surface beneath was uneven, hyperæmic, and moist. To add to the multiplicity and variety of these lesions, there were smooth, blackish, elevated plates covering the backs of the feet (*ichthyosis noire cornée* of the French); small horns, $\frac{1}{8}$ inch (3 millimetres) above the skin; crateriform depressions and large papilloma-like excrescences, almost fungoid in appearance, behind the ears. The skin was not oversensitive, but there was a nearly universal pruritus accompanied by scratching, with an intolerable stench from decomposing epithelium. The disease was of many years' duration, and had gradually reached the extremely marked appearance presented on examination. The microscopic appearances indicated a keratosis of the epithelial lining of the follicles, which, by extension downward, gradually produced a pouch-like depression. The capacity for corneous metamorphosis was so great at the bottom of this pouch that the horny material was gradually pushed out above the surface of the skin. White, while concluding that his case may belong to that rare condition known as "ichthyosis hysterix," believes that the condition was not one of true ichthyosis.

Darier[287 July] recently published a paper entitled "*Psorospermose Folliculaire Végétante.*" The patient, or rather one of the patients, on whose case Darier based his observations, was shown at the International Congress of Dermatology, held at Paris in August. A previous case had been studied by Thibault.[1115 May] White, who was present at the Congress, recognized Darier's patient as showing the same disease as that which he himself had previously described as above.

Darier[287 July] concludes that there exists in man a group of diseases which deserve the name of psorospermoses, due to the presence in the epidermis of parasites of the order of Psorozoaires. This class includes the gregarinæ; the oval psorospermæ, or coccidiæ; the sarcosporidiæ; the psorosperms of fishes, or myxopsoridiæ; and the psorosperms of the articulates, or microsporidiæ.

All these organisms live as parasites upon other animals, and give rise in certain cases to fatal diseases.

In the affection *psorospermose folliculaire végétante*, coccidiæ of a particular kind invade the follicular orifices under the form of round bodies, generally encysted, and contained within the epithelial cells, or of refracting granules, the accumulation of which forms a plug, which projects from the mouths of the follicles. This affection, in its etiological relations, should be placed with Paget's disease and probably with molluscum contagiosum.

On White's return to this country last autumn, he,[245 Jan.,'90] observed a similar case, in which he had careful microscopic examinations made of its lesions in the light of Darier's observations. The conclusions at which he arrives are: 1. That the bodies observed by Darier are, in all probability, to be found in all cases of the disease. 2. That they are probably present in every lesion. 3. No definite inference can be drawn from the appearance of these bodies as to their being parasites or not. 4. If it is admitted that Darier's bodies are parasites, we cannot as yet (in view of the innocuous character of such parasites as the demodex folliculorum) regard them as causing the tissue-changes noted. 5. No evidence of contagion has been adduced. 6. The same bodies are found in molluscum contagiosum, and probably in other skin diseases.

Cornu Cutaneum.—Bland-Sutton,[2 Feb.2] at a meeting of the London Pathological Society, exhibited various specimens of cutaneous horns growing from sebaceous cysts, warts, and cicatrices of burns. It had been asserted that each of these varieties showed peculiar laminations, but this was a mistake.

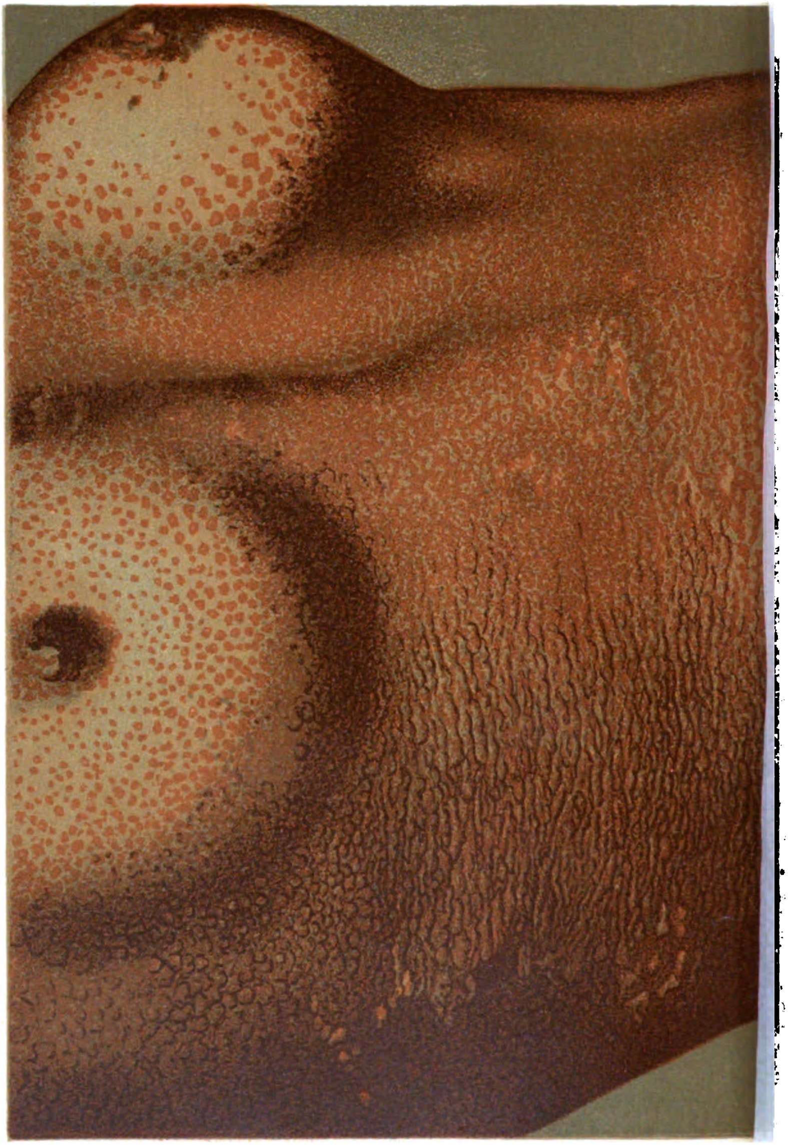
Psoriasis.—Our corresponding editor, Ducrey, of Naples, Italy, reports that Lusiani has obtained a rapid cure (twenty days) in a case of chronic psoriasis by Hansen's method. His doses of potassium iodide are even more heroic than those of Hansen and Bardizzi. He began with 3 grammes (45 grains), and pushed the iodide to 15 grammes (225 grains) daily.

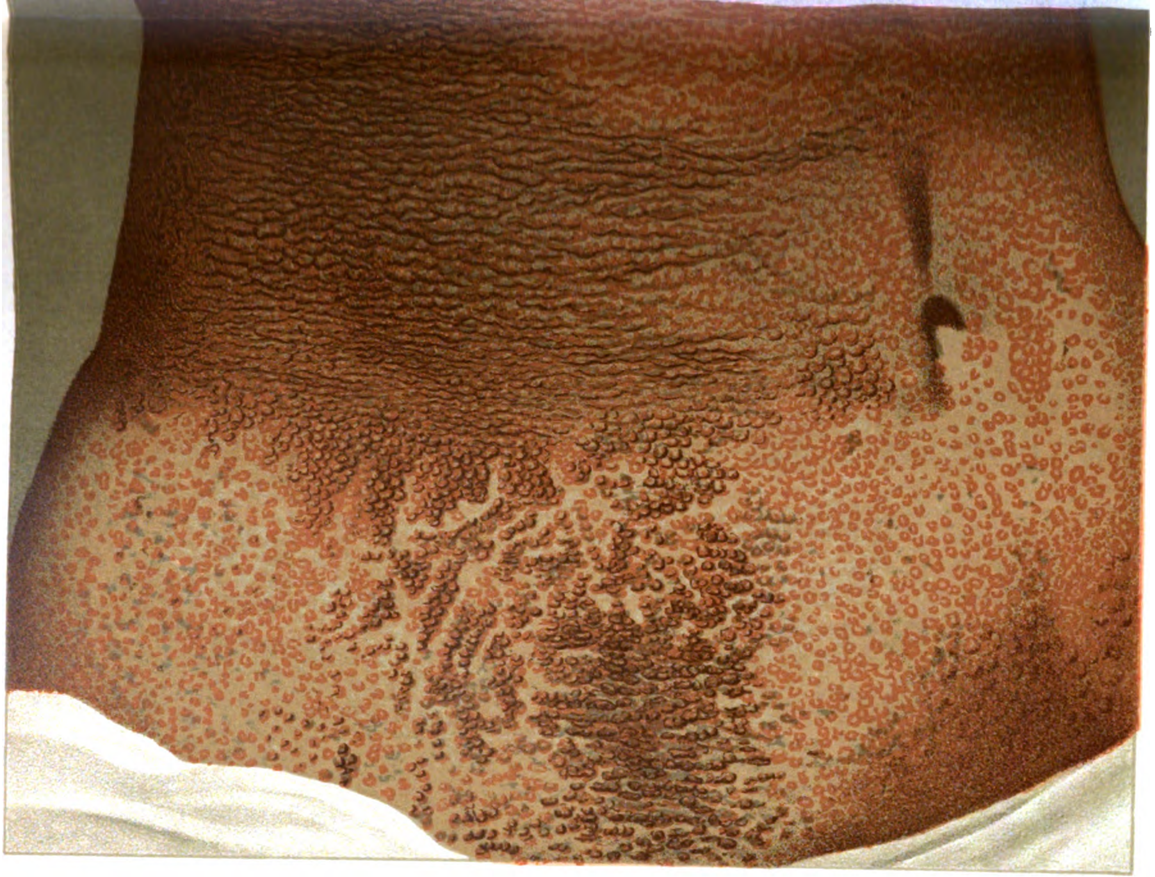
Lichen Ruber—Lichen Planus.—One of R.W. Taylor's masterly monographs,[1 Jan.6] has appeared this year on the subject of lichen planus, accompanied by portraits and cuts which have been reproduced for the ANNUAL on account of their excellence and the present importance of the subject. Taylor says that, in America, nothing was known of lichen ruber up to 1874 except through Hebra's writings. It was supposed that we had l. planus in America, but no l. ruber. Some observations made in this country about that time led to the belief that l. planus and l. ruber were different forms of the same disease, and that view has retained currency here ever since. Later American investigations, however, go to show that the two diseases are separate and distinct from one another. L. ruber, however, is so rare in this country that few opportunities occur to compare the two affections. Recently, Taylor has had the opportunity to have under prolonged observation two very characteristic cases of l. ruber, and, in addition, has seen a few cases under the care of friends. His description of the disease, based on these cases, is as follows: The disease begins by the appearance of isolated papules, which rapidly multiply and coalesce, while the consolidated patches become more infiltrated with varying degrees of desquamation; the disease-area spreads by the appearance of new papules in the neighborhood.

Three stages of the disease may be noted. In the first, *the stage of isolation of the papules* (well seen on the arm and forearm in the second plate, extending from the coalesced patch at the inner aspect of the elbow), a subacute or "cold" inflammatory action is observed. The papules are pin-point to pin-head sized when first seen, and are hard, giving the skin a roughened feel. Examined on the thin skin with a lens, they look like little conical masses of yellow wax, and to the eye are of a neutral orange color. There is no circumferential area of redness.

When small, the papules are miliary and conical, or bee-hive-shaped (hence the name "acuminatus"), but as they grow larger they flatten out. The papules grow to a line in diameter, but no more. They then gradually flatten, and show a depression in the centre,—a kind of umbilication. The fully-developed papule is rounded or ovoid, not angular, star-shaped, or polygonal, like l. planus. The uniformity in size and appearance of the lesions is remarkable. In color the papules vary from a dark yellow to a brownish red, according to the condition of the circulation. They never show the deep, violaceous, or crimson red of l. planus. The disease develops by extension, not jumping from one part to another, and the entire surface may be gradually invaded.

In the second stage, that of *coalescence of the papules* (shown in the colored plate, on the abdomen and on the chest-walls), the papules are arranged in distinct and symmetrical rows, corresponding to the direction of the surface furrows and the connective-tissue frame-work of the parts. In this stage of the eruption lichen ruber may be said to be fully developed, since beyond it retrograde changes are observed. It is then a vast conglomeration of fused papules, of a characteristic warm, brownish-red color,

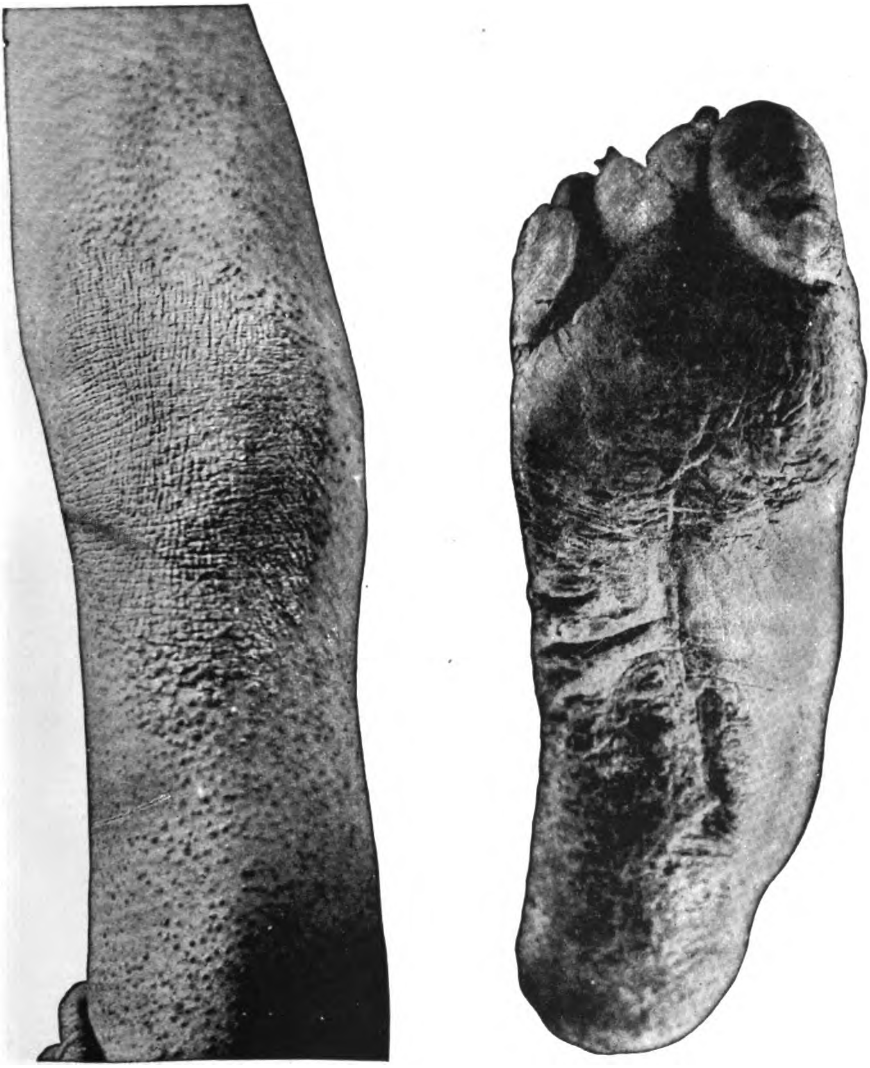




Lichen Ruber (Taylor).

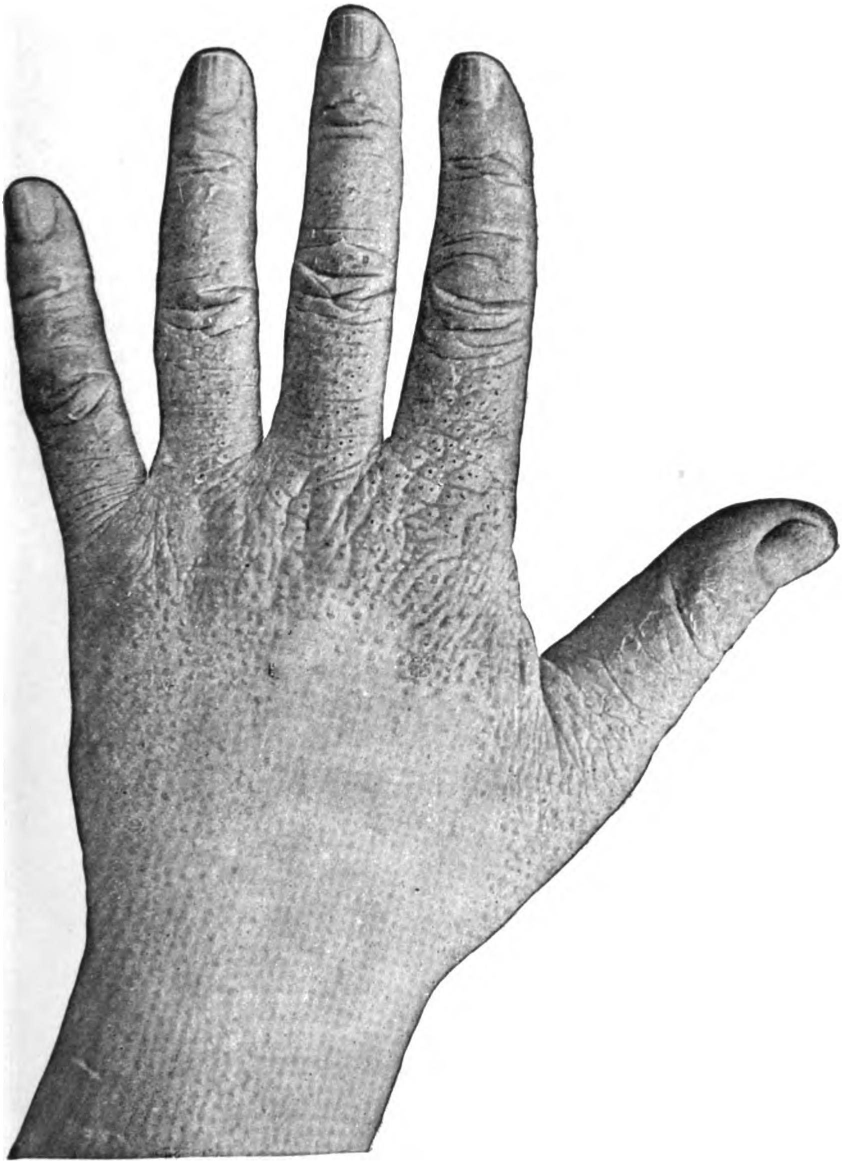
New York Medical Journal.

Bush & McFetridge Lith. Phila



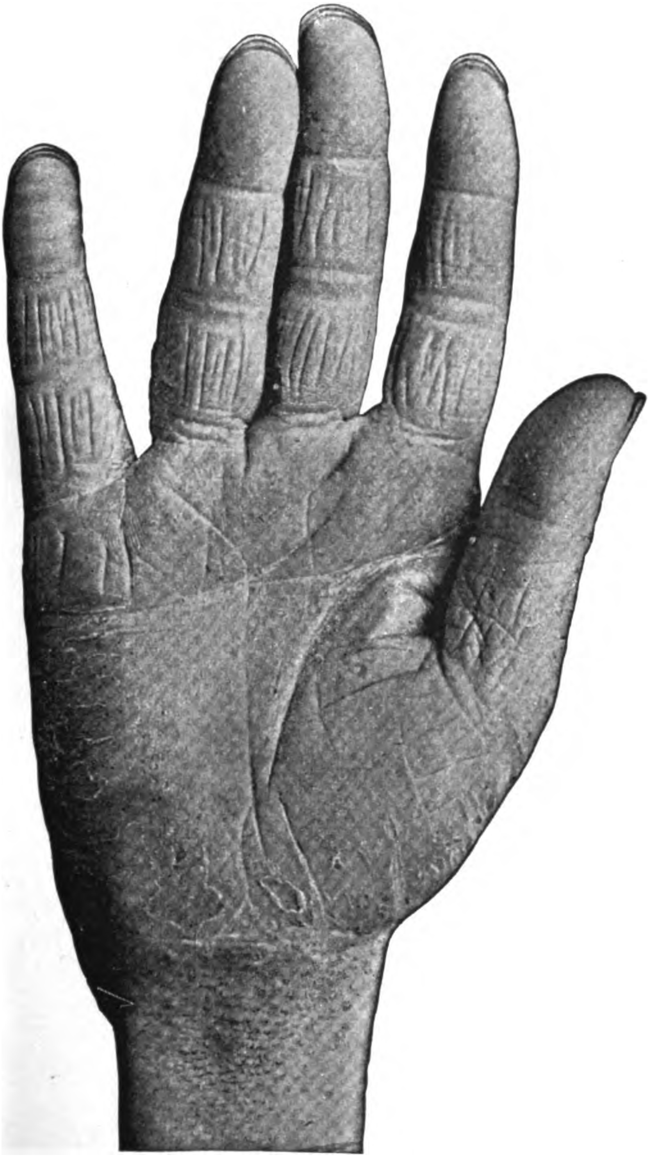
Lichen Ruber. (Taylor.)

New York Medical Journal.



Lichen Ruber. (Taylor.)

New York Medical Journal.



Lichen Ruber. (Taylor.)

New York Medical Journal.

giving forth their brawny scales in moderate quantity. When the finger is passed over an extensive surface, a dry, smooth, leathery feel is communicated. There is decided though superficial infiltration of the skin, more like that of dermatitis exfoliativa than that of eczema. Later on, it may become more pronounced, especially on the palms or soles.

Gradually the papular elements become effaced until the eruption consists of a uniform, brownish-red, slightly scaly, superficial thickening of the skin, which is traversed by the minute natural furrows of the skin in various directions. Owing to the increase in the corneous elements of the skin these furrows become deeper than normal, and they divide up the morbid areas like the hide of an alligator. This constitutes the *third stage*, in which the disease is chronic, indolent, infiltrated, scaly, and slightly pigmented, all signs of previous papulation having disappeared, and no new lesions then showing themselves. The disease may then undergo involution in a longer or shorter period. In Germany it is said that a dry, file-like, harsh, infiltrated skin results, the superficial disease having thus caused a true inflammation of the whole thickness of the skin. The colored plate appended gives a view of each of these stages of the disease.

In Plate 3 are shown, with admirable fidelity, the appearances of the palm in Taylor's case, which are essentially those of chronic, scaly, and infiltrated eczema. The patient, moreover, complained of the sensation of tension and impairment of movement so constant in the latter affection. In Plate 2 the epidermal thickening is shown in a marked degree upon the sole of the foot. The increase of the corneous cells was very great. Such a condition is never seen in lichen planus.

Finally, Taylor calls particular attention to the condition of the nails, which, in Plate 4, are shown to be opaque, of a dull-white or dirty-yellow color, rough and serrated on their surfaces, and fully four times their normal thickness, as is clearly shown in Plate 3. It is natural to suppose that a disease the acme of which is seated in the corneous layer of the skin should work a radical change in the nutrition of these kindred appendages. There is no concomitant nail affection in lichen planus.

Taylor appends the following table of differential diagnosis between lichen ruber and lichen planus:—

DIFFERENTIAL DIAGNOSIS.

LICHEN RUBER.	LICHEN PLANUS.
1. A very rare disease.	A not uncommon disease.
2. A disease of remarkably constant uniformity of type-form, its lesions passing through definite stages of evolution without the slightest tendency to polymorphism, and finally being lost in a general thickened condition of the skin.	A disease sometimes showing much deviation from the type-form, chiefly by reason of the not uncommon great increase it causes in the epidermal layers which convert the patches into dense, hard, rough, dark-brown, even crimson-brown, uneven, rugose patches of irregular outline (knees, elbows, and sometimes wrists).
3. Symmetrical in its distribution, spreading from the upper parts of the body downward in anatomical succession.	As a rule, symmetrical in its distribution, beginning usually on the inner aspects of the forearms near wrists, on lower parts of abdomen and inner parts of thighs and legs, chiefly near knees. Beginning on a region or regions, it tends to spread, in a more or less discrete manner, over them alone.
4. Shows a tendency to attack a large extent of surface, and even to invade the whole body in a uniform way. Face almost, as a rule, affected.	Shows a tendency to limitation on the extremities, lower abdomen, and neck; not known to attack the face. Rarely involves large surfaces in a uniform eruption, and never the whole body, even in a discrete manner.
5. Morbid changes seem to begin superficially in corneous layers.	Morbid changes begin in the substance of the corium.
6. Not perceptibly inflammatory in early stages; no hyperæmic areola.	Consists of circumscribed inflammatory spots and patches; hyperæmic areola usually present, though not extensive, and may be absent.
7. Slowly but surely tends to extend.	May extend to other regions, but very commonly remains indolent and localized.
8. Begins as small, conical papules of waxy appearance and of neutral-orange or slightly brownish-red color, which, in due time, become obtuse, then flat, with a slight central depression and very moderate desquamation; surfaces smooth and shiny, but not silvery or micaceous.	Begins as red papules, not markedly conical, which flatten out into round, oval, angular, and star-shaped outlines, with silvery surfaces covered with much-thickened corneous layers, and with noticeable central depression; surfaces very frequently shiny and micaceous; never having a waxy look.
9. Papules reach their full development (a line or less in area) and never grow larger. Large patches always formed by the multiplication and fusion of papules of uniform size.	Papules increase by peripheral growth until usually they attain a diameter of 1 to 4 lines; may develop into true patches, chiefly from irritation, friction, and pressure (scratching, irritation of coapting surfaces, strong applications, garters and bands around body); may develop *de novo* on scratch-marks. Large patches formed by fusion after moderate or excessive peripheral growth of papules.
10. Papules seem destined to reach maturity after a due process of growth	Old papules may show a tendency to undergo involution sometimes quite

and then to fuse into patches which may, later on, undergo involution. No exceptionally early or premature involution occurs in a single or several papules. They all seem to hang together.	early, while new ones appear close by or at a distance. Each papule seems to run a course entirely irrespective of its fellows, either of short or long duration. They do not, as a rule, "hang together."
11. Color of papules at first of a neutral orange, and, as they grow in size and in proportion as they become aggregated, they are of a warm brownish-red, which is often heightened by acceleration of the circulation.	Color of papules at first of a deep-red, which soon becomes of a purplish, violaceous, or lilac hue. On lower limbs sometimes of a deep, even bluish-red, color. Not much influenced by the circulation.
12. In chronic stage all traces of papules lost; the surface is rather rough to the touch, but of an even plane and of a brownish-red color.	In chronic stage, particularly where the epidermis is thick (knees, ankles, elbows [rare]), epidermal hypertrophy results in dense, hard, uneven, sometimes rugose surfaces, even to a marked verrucous condition, with a deep-red, even bluish-red, color. Traces of original lesions entirely gone.
13. Patches diffuse, even involving whole regions, not very scaly, of uniform, even surface, traversed by the deepened and much-exaggerated natural furrows of the skin; of remarkable uniformity of color.	Patches covered with much abnormal adherent epithelium, desquamating moderately; very irregular in outline and size, of decidedly uneven surface, without uniformity of color, which may even vary from day to day from silvery hue to a dull red.
14. Invades the palms and soles in totality in uniform patches.	Not common on palms and soles; when present, consists of localized patches.
15. Attacks the nails, causing hypertrophy, impairs their nutrition, and may even destroy them.	Nails unaffected, except very rarely, in inveterate cases, by extension from the backs of the hands.
16. Causes impairment of nutrition and loss of hairs, chiefly of body.	Hairs unaffected.
17. Not known to attack mucous membranes.	May attack mucous membranes (mouth and glans penis).
18. Leaves a diffuse, uniform, not accentuated yellowish-brown pigmentation, in large expanses.	Leaves dull-red, brownish-red, rusty-brown, crimson-brown pigmentation in spots and irregular-shaped patches.
19. Itching very mild, if ever present, at its early evolution; may be moderate in chronic stages. Never severe or in proportion to the extent of lesion and of surfaces involved.	Itching very often severe at time of invasion; is present afterward in mild or intense form, usually in exacerbations.
20. Attended with concomitant emaciation; in inveterate cases, death by exhaustion.	No emaciation nor, as a rule, any serious systemic action.

The prognosis of lichen ruber, as first described by Hebra, was very unfavorable. We now know, however, that many cases recover. Taylor's limited experience has been favorable as regards the result on the patient's general health and strength.

The treatment of lichen ruber has been summed up by the

German authorities in one word—arsenic. Taylor's experience is different. While using alkaline diuretics,—iron, quinine, phosphoric acid, and strychnia,—he lays much stress on external applications.

Frequent hot alkaline baths (salicylate of soda and borax 100° to 115° F.—37.77° to 46.11° C.) are of the greatest value. They relieve the cutaneous hyperæmia, soothe the pruritus, carry off the effete epidermis, and undoubtedly cause absorption of the products of inflammation. Brisk and thorough frictions daily with the *tinctura saponis cum pice*, made, preferably, several hours before the bath, may be employed. When these cannot be used the body should be freely anointed with vaseline. Upon the hands, where the epidermis is thickened and cracked, the parts should be continuously covered with ung. diachyli, containing 1 drachm (3.90 grammes) of balsam of Peru to the ounce.

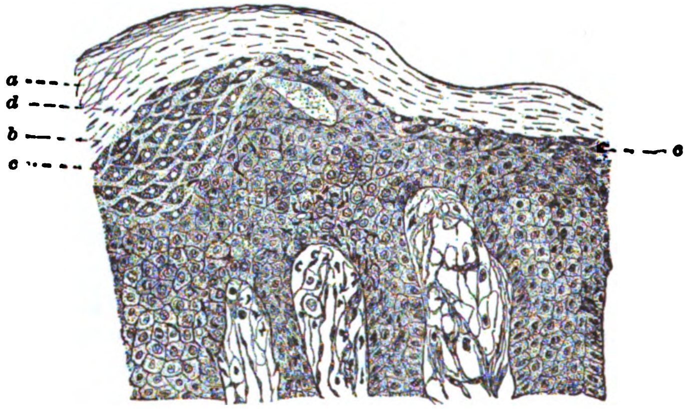


FIG. 1.—FROM THE HYPOGASTRIC REGION, SHOWING AN INVASION OF THE RETE BY LEUCOCYTES, A DEEPENING OF THE STRATUM GRANULOSUM, AND THE ŒDEMATOUS CONDITION OF THE PAPILLÆ.

a, stratum corneum; *b*, stratum lucidum; *c*, stratum granulosum; *d*, small cavity with granular contents. (*New York Medical Journal.*)

Microscopical Examination and Pathology.—Portions of the excised skin from the hypogastric region and from the outer and upper surface of the thigh were hardened in alcohol; other portions from these places were prepared with chloride of gold (Chrzonszewsky's method); other pieces were treated with a 1-per-cent. solution of osmic acid for twenty-four hours, this giving the best results. The sections were stained with hæmatoxylon and eosin. The patches of skin taken from the hypogastric region were covered with papules in various stages of closeness of packing, while that from the outer surface of the thigh was studded with discretely-placed lesions.

The changes in the epidermis consisted of a hypertrophy of all its layers, with infiltration of the rete mucosum, with leucocytes and a pigmentation of many of the deepest cells of the rete.

The surface of the skin from the thigh and hypogastric region was very uneven and corrugated. In all the portions examined there was a thickening, in varying degrees, of the epidermis, with inward prolongations here and there of the interpapillary portions of the rete mucosum (Figs. 1, 2, and 4). In places the corneous layer was very much thickened (Fig. 4), and often its superficial laminæ were packed together rather densely, as though flakes or crusts were being formed. The stratum lucidum was also thicker than in check sections of normal skin from the hypogastric region (Figs. 1 and 2).

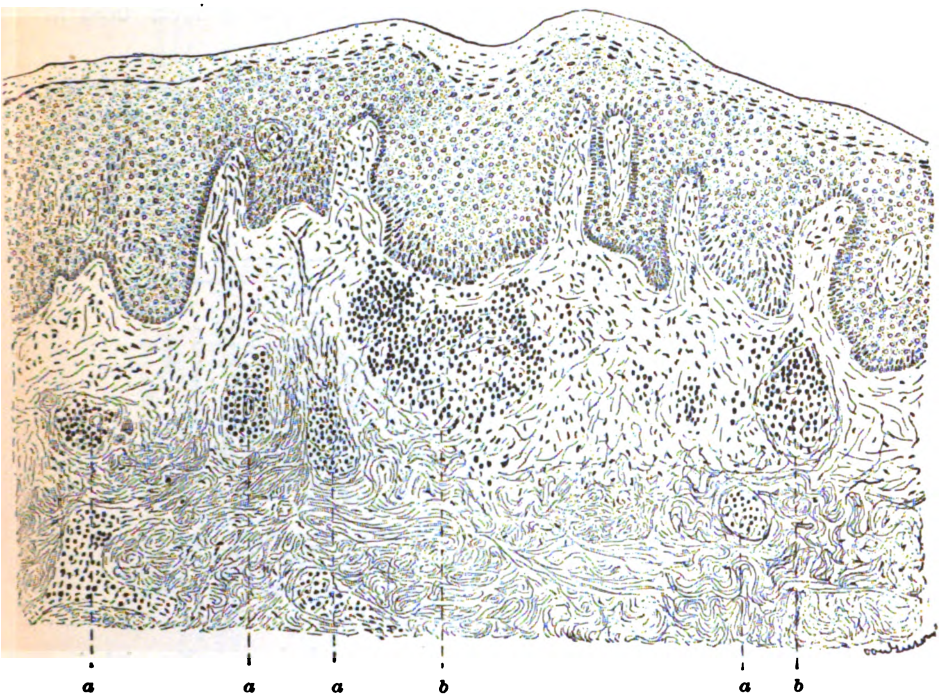


FIG. 2.—FROM THE THIGH, SHOWING HYPERTROPHY OF THE EPIDERMIS. At *a*, collections of small, round cells around the vessels of the papillary derma; at *b*, larger clusters of small, round cells.
(*New York Medical Journal.*)

There was a premature keratosis of many of the cells of the rete mucosum, as the cells of the stratum granulosum, which contain the eleidin droplets of Ranvier (keratohyalin substance of Waldeyer), extended in places to a considerable extent into the rete Malpighi (Fig. 1, *c*). Frequently these cells lay as deep as a line midway between the lower surface of the stratum lucidum and the level of the apices of the papillæ. This eleidin substance is believed to be intermediate in its chemical composition between the cell-protoplasm and the corneous material. There was a general slight invasion of the rete with leucocytes. These were most abundant in the lower layers of the cells, as is seen best in osmic-acid preparations (Fig. 1).

In the superficial layers of the rete, just beneath the stratum lucidum, were a limited number of small cavities almost completely filled with granular detritus (Figs. 4, *m ;* 1, *d*). These cavities seemed to be produced by a disintegration of some of the superficial epidermis-cells, as there were groups of these cells with indistinct outlines and shrunken nuclei. Their protoplasm was transparent, and did not stain with eosin.

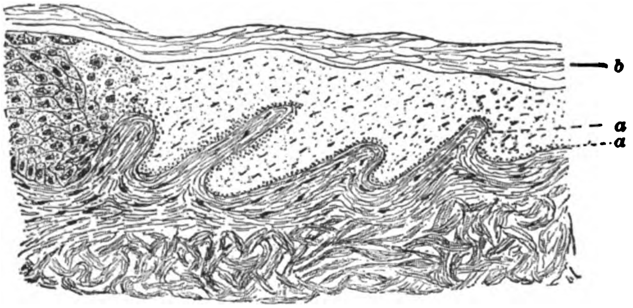


FIG. 3.—SHOWING A PORTION OF THE RETE MALPIGHI WHICH IS CONVERTED INTO A ZONE RESEMBLING THE STRATUM LUCIDUM. THIS ZONE IS TRANSPARENT, SLIGHTLY GRANULAR, AND CONTAINS A FEW FLATTENED NUCLEI
a, layer of brownish pigment-granules at the junction of the degenerated rete Malpighi with the derma; *b*, stratum corneum.
(*New York Medical Journal.*)

The skin from the hypogastric region was grooved with a few deep, narrow furrows lined with a degenerated layer of epidermis-cells, resembling the stratum lucidum in structure, which extended, in some sections, nearly to the derma (Fig. 4, *h*, *h*). The partially degenerated epidermis seemed to have been loosened from some places in these furrows by a cracking or a stretching of the skin, leaving the corium bare (Fig. 4, *g*). The degenerated zone was composed of a degenerated, slightly granular, translucent substance which did not stain with hæmatoxylon or eosin, and contained a few flattened, scale-like nuclei. In the skin from the hypogastric

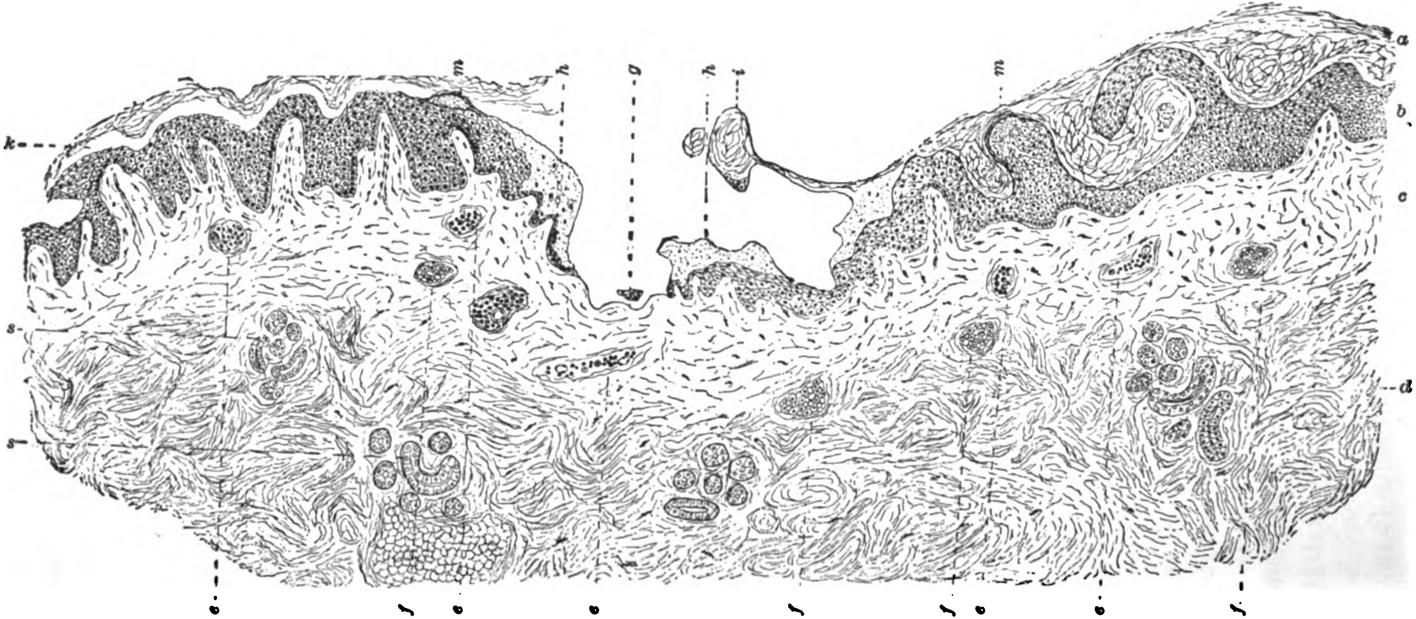


FIG. 4.—FROM THE HYPOGASTRIC REGION, SHOWING A MODERATE HYPERTROPHY OF THE EPIDERMIS, AND INCLUDING ONE OF THE DEEP FURROWS LINED WITH PARTIALLY DEGENERATED EPIDERMIS.

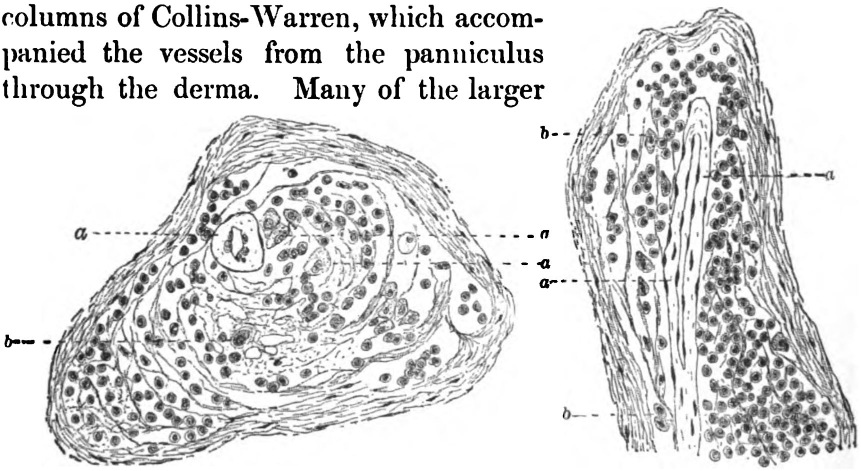
a, corneous layer; *k*, stratum lucidum; *b*, rete Malpighi; *c*, papillary derma; *d*, subcutaneous connective tissue; *e*, clusters of small, round cells around the blood-vessels; *f*, hypertrophied smooth muscle-bundles; *g*, bottom of the furrow from which the epidermis at *i* has apparently been excoriated mechanically; *h*, degenerated zone of the rete resembling the stratum lucidum; *m*, small cavities beneath the stratum lucidum filled with granular material; *s*, sweat-glands.

(*New York Medical Journal.*)

region there were a few small patches in which the entire breadth of the rete mucosum was converted into a zone resembling the stratum lucidum in structure (Fig. 3). The papillæ and papillary derma beneath these patches of degenerated rete were slightly denser than the surrounding corium (Fig. 3).

The lesions in the derma consisted of changes in the blood-vessels of the papillæ and pars papillaris and their perivascular spaces, in the smooth muscle-fibres, and in the hairs.

The endothelium of many of the smaller vessels was swollen and granular. The perivascular spaces of the vessels of the pars papillaris were uniformly filled with an exudation of serum and small, round cells in varying proportions (Figs. 4, *e*; 5; 6; 2, *a*). Among the small, round cells were a few larger, rounded, granular cells, some of them having a cell-wall (Figs. 5, *b*; 6, *b*). The perivascular spaces contained a delicate reticulum, composed partly of the adventitia of the blood-vessels and partly of the stroma of the fat-columns of Collins-Warren, which accompanied the vessels from the panniculus through the derma. Many of the larger granular cells were probably metamorphosed fat-cells of the atrophic fat-columns. In the papillary derma, lying often close to the rete, were a few larger clusters of small, round cells, in the vicinity of which the connective-tissue cells were increased in number.



FIGS. 5 AND 6.—ILLUSTRATING A TRANSVERSE AND A LONGITUDINAL SECTION OF TWO SMALL VESSELS (*a*, *a*) OF THE PARS PAPILLARIS, WITH THEIR PERIVASCULAR SPACES FILLED WITH SMALL, ROUND CELLS, AND AT *b* A FEW LARGER CELLS LYING IN THE MESHES OF A DELICATE RETICULUM.
(*New York Medical Journal.*)

The papillæ in osmic-acid specimens from the hypogastric regions were very œdematous. Their interfibrillary spaces were distended with fluid and contained a few leucocytes.

The smooth muscle-bundles were hypertrophied.

Only a few hairs were found in the sections, and in a longitudinal section of one hair the dermic sheath was thickened, and the bulb of the primary hair was shrunken and fused with its papilla. Just above and at one side of the primary hair-bulb was a secondary or false hair-bulb, composed of a group of outer root-sheath cells which pouched out slightly the dermic coat (Fig. 7).

Sections stained with Herxheimer's method for elastic fibres showed no abnormity in their number and arrangement.

The small nerve-bundles in the subcutaneous connective tissue were normal (osmic-acid staining). In sections prepared with chloride of gold only a few of the fibres of the subepidermal plexus were stained.

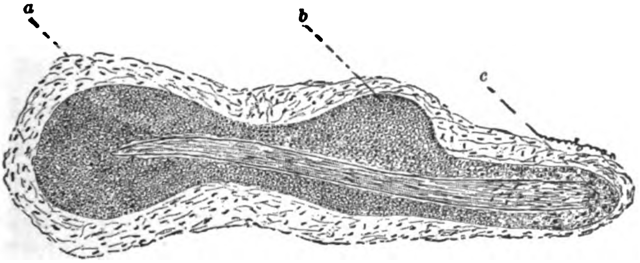


FIG. 7.—OBLIQUE SECTION OF AN ATROPHIC HAIR.
a, thickened dermic coat; *b*, false or secondary bulb, composed of a mass of epithelial cells, corresponding to the cells of the outer root-sheath, which pouches out slightly the dermic coat; *c*, atrophied bulb and papilla. Above the false-hair bulb there is a thickening of the outer root-sheath.
(*New York Medical Journal.*)

The sweat-glands were normal, except that the orifices of some of them showed a funnel-shaped dilatation. No sebaceous glands were found in the sections.

No bacteria were found either in the sections or cover-glass preparations of the blood.

Taylor concludes that there was in this case of lichen ruber an hypertrophy of all the layers of the epidermis, associated with an exudative inflammation in the papillæ and papillary derma.

Hallopeau$^{17}_{\text{No. 26}}$ says that no definition of lichen, as yet given, implies a clearly-defined morbid condition. The group "lichen" is artificial. There are arbitrarily included in it different affections having only their papular character in common. Some term or terms derived from pathological anatomy and physiology should be substituted for the word "lichen," which should only be used for the affection described under this name by Wilson. The qualification "l. planus" is merely applicable to a variety of this disease. An acute and a chronic form should be recognized, and under the latter such varieties may be discriminated as *lichen planus*, *obtusus*, *acuminatus*, *tuberosum*, *horny*, *coralliform*, *sclerous*, *and lupus*. The acute form of lichen comprises some of the cases published under the head of *l. ruber acuminatus*.

Török, of Buda-Pesth,$^{3}_{\text{p.346}}$ describing the histology of *lichen planus*, says that the papule at first shows itself by inflammatory phenomena without proliferation of epithelium. The umbilication of the smallest papules is caused by the presence of a sudoriparous gland-duct holding the centre down, while the periphery is raised by the papillary layer. The depressed surface of the annular lesions is due to atrophy of the papillary body.

At the meeting of the International Dermatological Congress at Paris, Kaposi$^{3}_{\text{Aug.7}}$ said that Hebra had described, under the name *lichen*, two affections,—*l. ruber* and *l. scrofulosorum*. The first of these terms was accepted without hesitation up to 1874. Since then divergent views have obtained, until Besnier thought it desirable to distinguish *pityriasis rubra pilaris* from the *lichen ruber acuminatus* of the Americans, from the *lichen ruber* of Hebra, and finally from Unna's type of *lichen ruber acuminatus*. Kaposi is surprised to learn that there are three different species of *l. ruber acuminatus*, and begs to add a fourth, the *l. ruber acuminatus* of Kaposi, which has precedence of all the others in point of priority. Kaposi showed drawings demonstrating the autonomy of his disease, which has recently been denied by Brocq and Rona, who only admit the *l. planus* of Erasmus Wilson as a *l. ruber*. On the other hand, says Kaposi, Taylor, Piffard, and Robinson, the American writers, refuse to recognize Wilson's disease as *l. ruber*, only giving this name to *l. ruber acuminatus*. Besnier and Richaud seem, according to Kaposi, to have made "confusion worse confounded" in this unhappy mess by isolating *pityriasis rubra pilaris*, and distinguishing this from Kaposi's *l. ruber acuminatus* or the *l. ruber* of Hebra.

Kaposi sums up by asserting that the *l. ruber* of Hebra corresponds exactly to his *l. ruber acuminatus*, which is an entirely different disease from the *pityriasis rubra* of Hebra. The *pityriasis pilaris* or *p. rubra pilaris* of Besnier, C. Boeck, and others is identical with Kaposi's *p. ruber acuminatus.* The *l. planus* of E. Wilson is also a *l. ruber*, because the plane and acuminate elements coincide, or the latter becomes transformed into the former, and, finally, because their histological characters are identical. Passing to *l. scrofulosorum*, Kaposi says this has nothing in common with *l. ruber.* It is an affection characterized by papules arising from infiltration of the circumfollicular tissue, and is allied to suppurative folliculitis, as the pustules of acne. These papules are usually seated upon the trunk, particularly upon the abdomen, and occur in early youth. Hans Hebra believes in the non-identity of *l. ruber acuminatus* and *pityriasis rubra pilaris*, basing his views on the difference in gravity of the two affections. Hebra's 14 cases and 2 of Kaposi's died. *Pityriasis rubra pilaris*, on the contrary, is a benign disease. In addition, the symptoms and the pathological anatomy are different. In *l. ruber* the morbid element attacks the chorion first; in *pityriasis pilaris* the epidermis is first involved. The former affection proceeds from below upward, while the second progresses from above downward. Replying to Kaposi, Hans Hebra says he is surprised that any one could confuse the two diseases. Besnier's articles on *pityriasis pilaris* require fuller justice, instead of being misunderstood. C. Boech agreed with H. Hebra. The large, bright-red, smooth, supple, patches, the silvery look, the desquamation in large patches on scratching, all are highly characteristic of *pityriasis pilaris.* Hallopeau remarked that the group *lichen* is artificial, and various affections are arbitrarily forced into it which have nothing in common but the papular appearance of their lesions. Ultimately, the term *lichen* should be replaced by names taken from anatomy and pathological anatomy. Wilson's *l. ruber* alone deserves the name. *L. planus* is only a variety of the other disease. An acute and a chronic form should be distinguished. Under the latter head should be included the varieties now called *l. planus*, *obtusus*, *acuminatus*, *tuberous*, *horny*, *moniform*, and *sclerous.* The acute form includes some of those cases published under the name of *lichen ruber acuminatus.* Unna said that after Kaposi's assertion that there is no difference between cases called *pityriasis* *rubra pilaris* in France and *l. ruber acuminatus*, the identity of the *l. ruber* of Hebra with the *l. ruber acuminatus* of Kaposi could no longer be maintained. The latter should be looked upon as a further stage of Devergie's *p. rubra pilaris.* Unna referred to cases published by him in 1884, a little prematurely. He would not now call these *l. ruber acuminatus*, but *l. ruber neuroticus.*

Besnier concluded the discussion by the clearest and most satisfactory statement which has recently been made. He thought it desirable to preserve the term *lichen.* The type of *l. ruber* is that so wonderfully described by Erasmus Wilson. In extending the limits of the affection we have systematically and with corroborative facts brought together some apparently dissimilar affections, which, however, belong, in reality, absolutely to the same order. These are the following: (*a*) *Small papular lichen*, the type of *l. ruber acuminatus* predominating; (*b*) *Lichen with exclusively plain papules*, the pure type of Wilson's disease; (*c*) *Lichen with plane and acuminate papules*, the mixed form which is very common; (*d*) *Larger or giant papular lichen* (*l. obtusus* of Unna),—*l. moniliformis* of Kaposi, *l. hypertrophicus*, and *l. atrophicus.* Besnier repudiates *l. scrofulosorum* entirely, regarding it as a folliculitis.

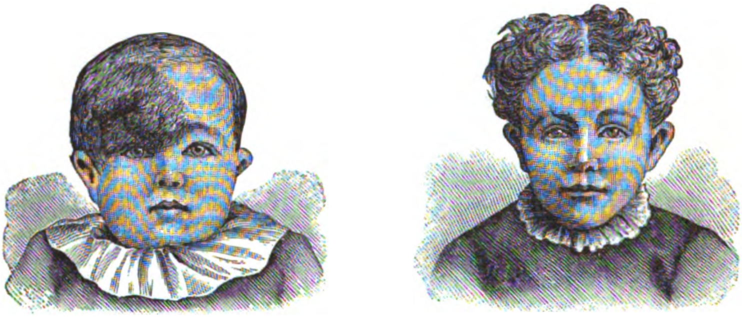
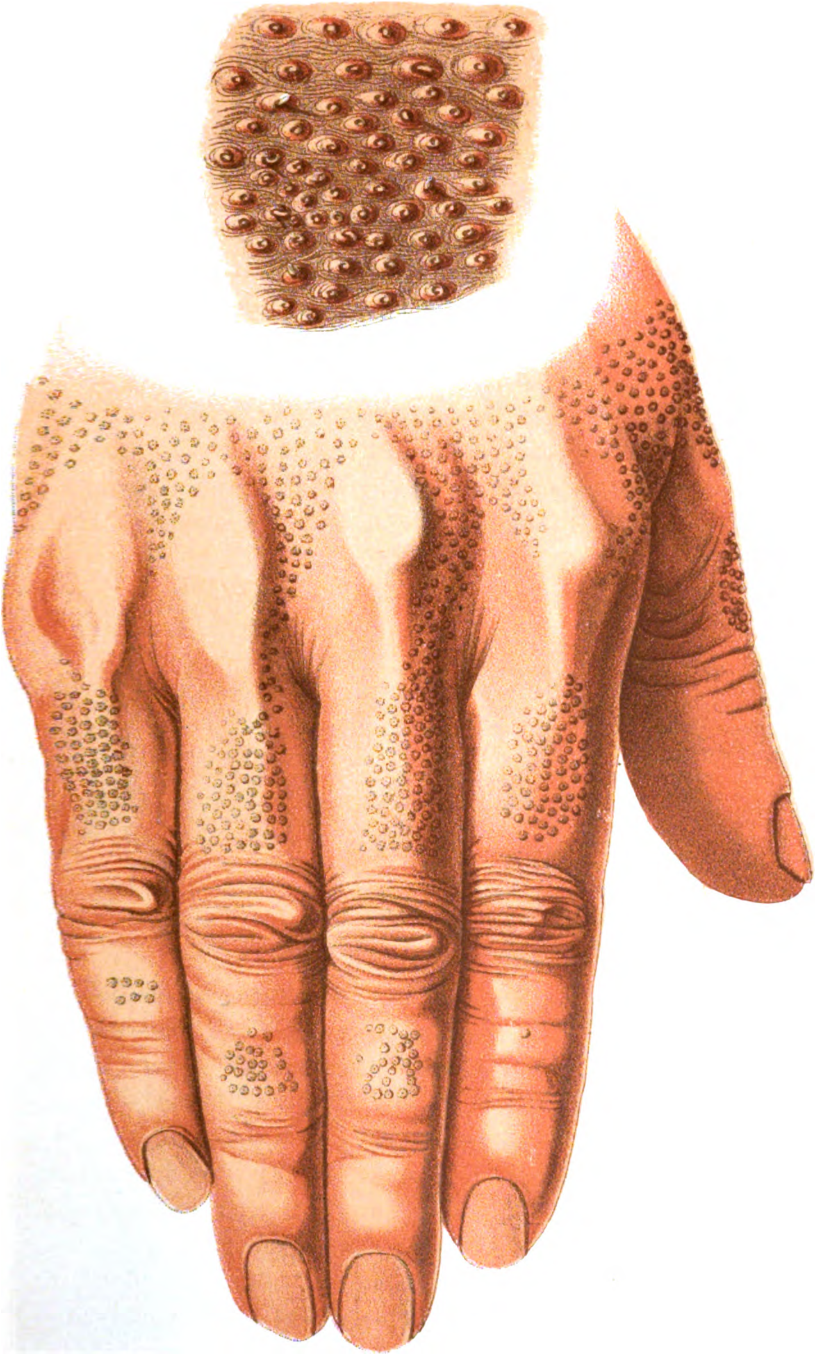


Fig. 1. Fig. 2.

Jamieson's Case of Hypertrichosis.

(*Practitioner.*)

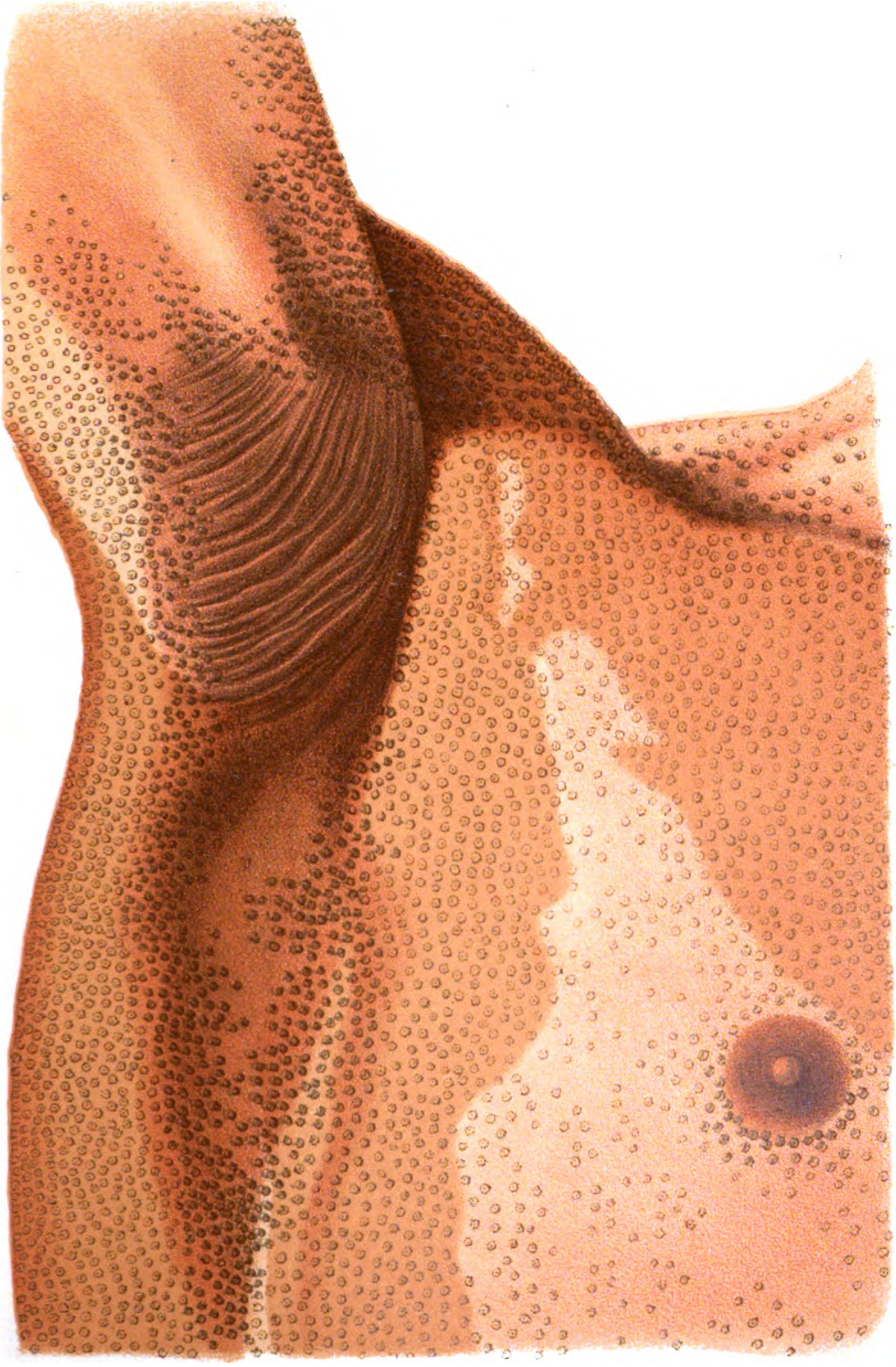
Hypertrichosis.—Jamieson[15 July] suggests a plan of treatment for hypertrichosis, illustrating it by the case of the patient represented above. Fig. 1 shows the little patient at the age of 3 months, just before treatment. The treatment was very simple, consisting in shaving successive portions and applying sodium ethylate, the patient being under the influence of chloroform. A number of successive operations gradually brought the condition of the face



Pityriasis rubra pilaire (Besnier).

Annales de Dermatologie.

Burk & McFetridge, Lith. Phila.



Pityriasis rubra pilaire (Besnier).

Annales de Dermatologie.

Burk & McFetridge, Lith. Phila.

to that represented in Fig. 2. This was taken recently, the child being 6 years old. The skin is smooth and nice-looking.

Alopecia.—Allan Jamieson[36 Oct.] describes a peculiar form of baldness, the result of folliculitis, extending from a common centre. Repeated attacks of pustular inflammation of the scalp, beginning in childhood, followed by individual folliculitis, resulted in the loss of hair in the parts affected. On the back of the neck the same condition had arisen, and had gradually extended, leaving a part bare and with a cicatricial appearance. Under the use of sulphur and ammoniated-mercury ointments, the condition had become quiescent and no more hairs had fallen out. This condition was first described by Quincke under the name of destructive folliculitis.

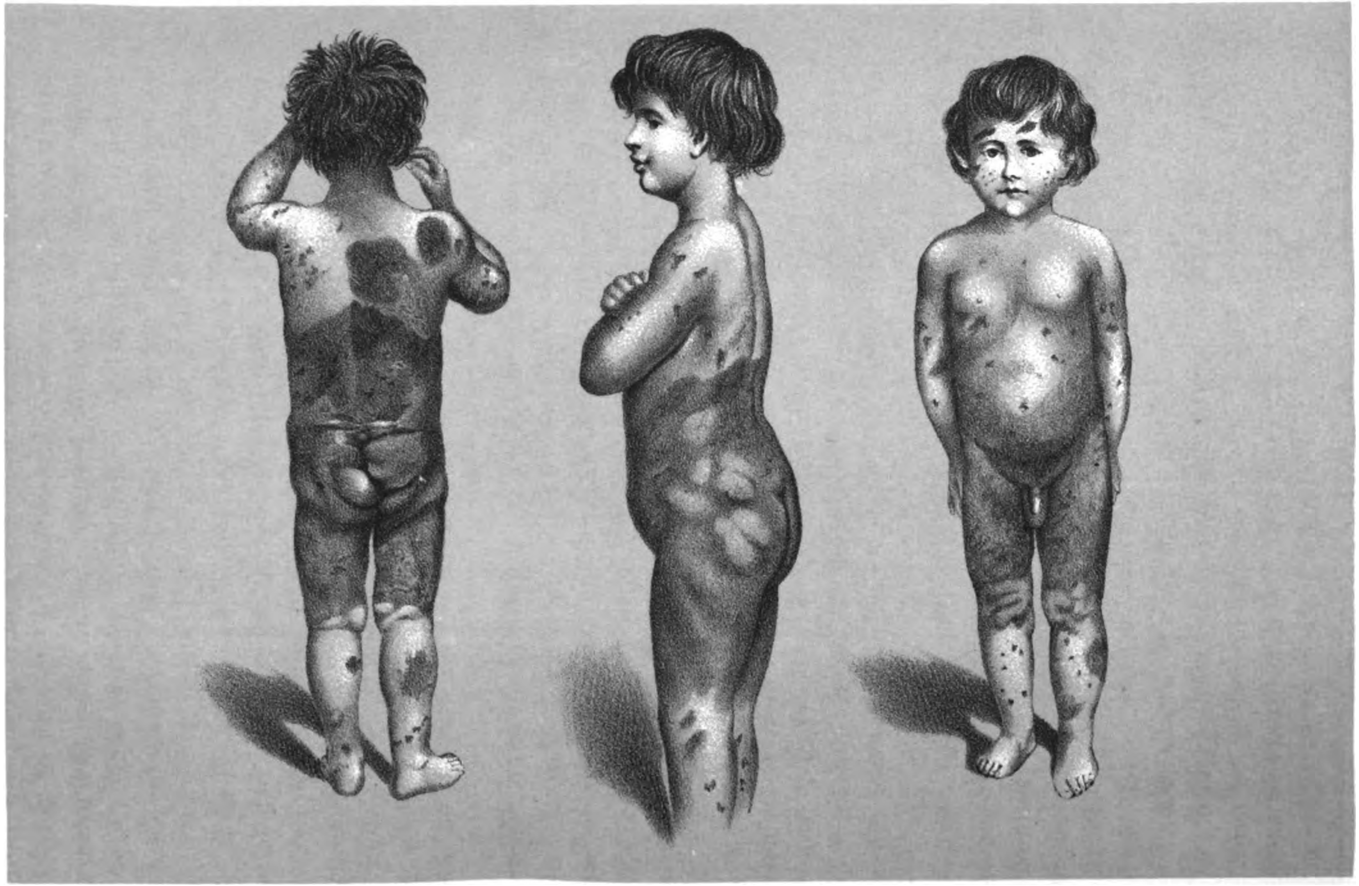
Pontoppidan[28 V.8,No.2] gives the case of a girl of 10 operated on for pigeon-egg-sized glandular swelling in the left carotid region. During the operation the jugular vein was wounded. On removing the dressing on the twenty-first day, two symmetrically-bald spots, circular, about the size of a dollar, were discovered on the back of the neck. The baldness grew and extended until, at the end of seven weeks, it corresponded to the area supplied by the nn. occip. maj. et minor. and the rear branch of the n. auricularis magnus. The skin was smooth and normal; sensibility not disturbed. Five weeks later the entire portion was thickly covered with a uniform growth of lanugo. Pontoppidan thinks that the compression of the injured cervical nerves by the tampon caused a neuritis. The symmetry of the patches, however, was curious. Pontoppidan explains this by the possibility of an invasion by a centripetally conveyed neuritis.

Alopecia Areata.—Bulkley[50 Mar.2] says that patients with alopecia areata should be put in the best possible condition hygienically. Thought must be directed toward nerve nourishment. The fats and phosphates should be increased in the dietary. Milk taken alone and between meals, crushed wheat, with cream and fish, are to be eaten. Bulkley's best results have been obtained under the free and continued administration of strychnia with phosphoric acid. Arsenic is of moderate value, and should be given in alternation with the former. Cod-liver oil in emulsion with a large proportion of phosphates is of value. Stimulation of the diseased patches sums up the principle of local treatment. Bichloride of mercury in a strength to moderately excite the skin is often good, but Bulkley's preference is for veratria ointment in the strength of 5 to 10 or more grains (0.32 to 0.64 gramme) to the ounce (31 grammes); croton-oil, strong carbolic preparations, acetum cantharidis, capsicum, and other stimulating applications may also be used with advantage.

Nævus Pilosus with Pigmentary Sarcoma.—Moller[84 Mar.20] says he has observed a case similar to that reported by Michelson in Ziemssen's "Hand-book," as observed by Schulz. Moller's case occurred in a 5-year-old boy without hereditary tendency to hirsuties. His parents were dark brunettes. An older and two younger brothers were also of very dark complexion. An older sister was a blonde. None of his relatives had had a nævus.

When the child was born his appearance was most striking. In addition to an enormous "swimming-drawers-shaped" nævus pilosus, numerous small marks and tumors could be seen on the hips and buttocks. There was also a marked and total absence of adipose tissue, with very slight muscular development about the buttocks and on the hips. At these points the skin hung in folds, and seemed as if wrinkled or shriveled. When from 2 to 3 years old, adipose tissue began to form and the muscles began to develop. The little boy only learned to walk when 2 years old. The absence of adipose tissue might easily account for the frequent excoriations about the hips and nates which developed into stubborn ulcers.

The plate shows the extent of this hairy nævus. The color of the hair was at first dark-brown, but later became somewhat lighter. In addition to the large, hairy nævus, innumerable smaller, from pin-head to hand size, hairy and hairless pigmentary nævi, situated in the back, chest, extremities, and chiefly in the face. One rapidly-growing tumor, the size of a small fist, over the sacrum was extirpated by Moller in the child's second year. Microscopic examination of this tumor showed deep pigmentation of the rete-cells, thickening of the papillæ with pigmentation. Spindle-shaped cells of large size were found in masses in the cutis. The adipose layer was almost wanting. The nævus was regarded as an extensive pigmentary one, with sarcomatous degeneration. In spite of the unfavorable prognosis drawn from the microscopic



Naevus Pilosus. (Moller.)

Wiener Med. Wochenschrift.

Burk & McFetridge, Lith. Phila.

examination, the patient, now in his third year, continues well, and no new tumors are reported by Moller.

Carcinoma.—Fernet $^{152}_{\text{No. 30}}$ alludes to a case of carcinoma which he had reported to the Clinical Society of Paris two or three months previously, where miliary subcutaneous cancers developed in a man affected with cancer of the stomach, with propagation to the peritoneum and also to the pericardium, under the form of cancerous lymphangitis. The case seemed at the time unique, but since then Netter $^{7}_{\text{Nov. 18, '87}}$ had told him of a similar case which he had reported to the Société Anatomique. Recently, Fernet has met with a similar case. It occurred in a man of 51 years of age, who showed symptoms of incomplete intestinal obstruction of seven months' standing. A tumor was found about the cæcum and ascending colon, and later the liver was found enlarged with perceptible nodosities. Icterus followed. Subsequently, a subcutaneous tumor was observed over the crest of the left ilium, which, at the autopsy, was found to be cancerous and of the same nature as that found in the liver and about the cæcum. Fernet thinks many such cases go unnoticed because attention is particularly drawn to the disease of the internal parts.

Primary Scirrhus of the Skin.—Weeks $^{6}_{\text{Mar. 16}}$ describes the case of a man of 52 suffering from a tumor, the size of a hazel-nut, at the junction of the nose and forehead. It was hard, but not connected with the subjacent bone, and had been noticed about three months, during which time it had slowly increased in size. There had been no injury to the forehead. The skin over the tumor was thickened, but seemed in other respects to be normal. No internal growths were detected. The tumor was excised, and on examination appeared to be scirrhous. It returned at the end of four months. The tumor was again excised, and at the end of fourteen months had not returned. Under the microscope sections showed a portion of skin the deeper parts of which were infiltrated by a new growth. The squamous epithelium on the surface was normal and did not dip down into subcutaneous tissues, and there were no epithelial nests to be found. The hair-follicles and the sweat and sebaceous glands showed proliferation of their epithelium. The central portions of the tumor exhibited masses of epithelial cells packed in spaces bounded by fibrous tissue; between the individual cells there was no stroma. This is, of course, the ordinary structure of scirrhus; and, as there is no other growth of a similar nature in the body, Weeks supposes it may fairly be called a primary scirrhus of skin.

Dubreuilh,[188 June 28] gives the case of a woman of 56, in poor health, who had been treated a year previously for an ulcer of the left leg and a cold abscess of the right arm above the wrist. The patient suffered occasional "loss of consciousness." Some weeks previous to her admission into the hospital the patient had observed on the chest, and especially about the left breast, certain small, hard tumors, the size of a small hemp-seed, imbedded in the skin. After being under observation for about a year, until March 4, 1889, without any particular symptoms recorded, the patient was seized with epileptic convulsions, during the course of which an eruption of hard, elevated tumors, scattered and confluent in different places, sunken in the skin and continuous with it, suddenly appeared. The tumors were pin-head to almond sized, reddish brown, and pigmented. They showed a collerette of epidermis around their border. The eruption covered the lower portion of the trunk and the upper part of the thighs. Cyanosis, in various localities, accompanied the epileptic attack and disappeared with it. Hemiplegia resulted. On the right breast was a hand-sized erythematous patch. The lymphatic glands of the groins and neck were much enlarged. The patient had a series of convulsive attacks, ending in coma and death. The eruption was not much modified, but the erythematous patch on the breast disappeared and a black, sanguinolent bulla appeared on the sole of the foot. At the autopsy old cancer of the uterus was discovered, with great enlargement of the lymphatic system of the pelvis. Nothing else significant excepting that marked changes, due, as Dubreuilh thinks, to thrombosis of the superior longitudinal sinus, possibly the result of a similar disease-process as that of phlegmasia alba dolens, observed in connection with cancer of the lower extremities.

The microscopic examination showed alveolar cancer of the uterus of long standing. In the skin neoplastic cells were infiltrated in the interspaces of the fibrous tissue of the derma in its deeper and middle parts. The papillary layer was not affected. The infiltration was not diffuse. It formed well-defined foci, outside of which the skin was intact, while within the affected area the lesions were homogeneous and uniform. These foci originated in the middle strata of the derma, extending later toward the epidermis, which, however, was in no case involved, and spreading still more decidedly downward, involving even the *panniculus adiposus*. In the smaller foci the cells were infiltrated between the fasciculi of connective tissue, sometimes to the number of four or five only, spreading apart the normal tissue, which seemed otherwise unaffected. In the larger lesions of the skin this disposition into homogeneous foci of limited volume was likewise observed, but, in addition to the more-marked extension toward the surface and toward the deeper layers of the skin, the manner in which the neoplasm was constituted could be observed. At certain points great numbers of cell-nests of even size were observed, separated by a fibrous stroma not resembling the normal connective tissue of the derma. Later, the progress of the infiltration appeared to have caused the disappearance of the connective-tissue bundles of the derma, and a mass of cells growing denser in the deeper layers of the skin could alone be observed.

Xeroderma Pigmentosum et Atrophicum.—McCall Anderson[213, Feb.] reports a case of this curious and rare disease occurring in a boy of 10. At the age of 2, a number of sun-spots or freckles appeared on the skin of the face and neck. At first these disappeared in the winter and returned in the summer, but later they became permanent, the face and neck assuming a brown tint, which became nearly black in summer. The skin of the hands, forearms, feet, and, to a less extent, the legs passed through similar changes. Recently, small, reddish, and white cicatricial spots appeared upon the skin of the face, several of which had formed warty nodules, in a few cases ulcerating and forming pea-sized, crusted sores. The eruption was not congenital. It had never itched, and sensation was not impaired. His father and mother are healthy, but his only sister suffered with a similar eruption, and died at 9 of some chest disease. Anderson draws attention to the facts that the patient was otherwise healthy; pigment-spots and telangiectases formed (these are not noted above), followed later by cicatrices and atrophic maculæ, and finally by nodules. Microscopic examination of the latter showed them to be epitheliomatous. In this connection reference may be made to R. W. Taylor's masterly description of this disease in our report on Dermatology of last year.

Pemphigus.—Style[6, Oct. 10] reports two children who showed a few isolated blebs on the sole of the foot, legs, and the abdomen. There was slight constitutional disturbance and fever. There was no areola. Finding the children were in a nursery saturated with sewer-gas, Style concludes this to be the cause of the disease. He does not differentiate it from *impetigo contagiosa*, which should be done in reporting such cases as "acute pemphigus," the existence of which has been denied by some eminent dermatologists.

Dolega$^{326}_{\text{B.46,Nos.1,2}}$ reports a case of acute pemphigus in an adult, accompanied by hæmorrhagic nephritis. The patient, a poorly-nourished man of 27, was feverish, with marked enlargement of all perceptible lymphatic glands. Moist excoriations, crusts, papules, and bullæ existed in numbers over body, limbs, head, face, and mucous membrane of mouth and conjunctiva. The palms, soles, and anal region were free from eruption. The course of the eruption is not described. The fever abated by the end of a month and was followed by hæmorrhagic nephritis. The patient recovered. Here, too, the diagnosis does not seem to me to be clearly indicated, though erythema is excluded.

CHORIOBLASTOSES.

Lepra.—A very large number of contributions to medical literature on the subject of leprosy have appeared during the year. Many of these were merely reports of cases. Others deal with the subject in a general manner; others indicate new foci of the disease. Just as the telegraph brings to us daily news of all disasters and crimes the world over, and therefore old-fashioned readers of the papers imagine that the world is much more wicked than of old, and that the seasons and elements themselves seem to have broken loose from all restraint, so the news which we have of leprosy from all parts of the world makes us think, in spite of ourselves, that this disease has suddenly revived in an aggravated form and is spreading over the entire globe.

The important paper of Zambaco, of Constantinople, of which we are about to give a *résumé*, is a wholesome correction to this general excitement. He was educated in France, and is the author of a well-known classical monograph.[1116] He has set himself to stem the current of prejudice in favor of the contagiousness of leprosy, and, although he may not have proved his point, he certainly adduces a sufficient number of facts to modify somewhat our present views of the transmission of this disease.

In a communication read before the *Académie de Médecine de Paris* on "Leprosy in Turkey," Zambaco $^{10}_{\text{No. 22}}$ speaks of the interest which has succeeded complete indifference regarding this affection. Leprosy exists in Portugal, in Spain, in Italy, in Roumania, in Greece, in Turkey (where 4000 cases are said to exist); in France, where, apart from the small colony at Vitrolles, near Marseilles, Zambaco has reason to think that it exists in a light, anomalous, and abortive form, disseminated throughout the country. Sixteen hundred lepers in Norway, 130,000 in the English East Indian possessions, numerous cases in China, Persia, Russia, Japan, Tonquin, Siam, Anam, the Antilles, and the States of North and South America, all testify to the wide-spread character of this affection.

In spite of this general diffusion of the disease, Zambaco says that those who know most about it doubt its contagiousness, though many are wavering under the influence of recent microscopic discoveries of the bacillus. Zambaco, who has studied leprosy in Constantinople for nearly nine years, and who has 200 cases under continual observation, of which he has traced the history, and who go in and out freely among the citizens, has not as yet been able to lay his hand upon a single fact to prove the contagiousness of the disease. While he does not deny the facts brought forward in the Sandwich Islands, he simply states the result of his own personal experience, noting, however, how vastly it differs from the statement made that one Chinese leper landing in Hawaii has given rise to thousands of cases in the course of a score or so of years. Zambaco finds that leprosy exists in Egypt, though, until his visit there, its existence had not been suspected. He has been unable to find any cases of contagion. In Jerusalem he found in the German Hospital for Lepers 48 patients. The resident physician with his family occupied rooms in the hospital, and the attendants, who sleep in the same wards as the lepers, have known of no case of contagion for twenty years since the hospital was established. A German woman has washed the linen of the lepers and dressed their ulcers for thirty years without having contracted the disease. He saw in Jerusalem 2 cases of spontaneous recovery from leprosy. He remarks here that he has seen Danielsen's cured cases in Bergen and has also observed cases of recovery under his own care in Constantinople. He saw also in Jerusalem a number of married couples, one leprous, the other healthy, some of whom had cohabited for ten to twenty years without transmission of the disease. The physician of the leper hospital has had a leper nurse for his own children for some years, and has also allowed them leper children as playmates. This physician and his *confrère* are anti-contagionists. They believe, however, in the hereditary character of the disease. Zambaco visited the island of Samos, where leprosy has been endemic for generations. He gives a number of facts similar to those above cited, all going to show rare transmission of the disease. Two curious facts are worth transcribing:—

1. A woman affected with leprosy was about to be banished from her native village some years ago (the common people dreading contagion, curiously enough), when the then Prince of Samos caused her to be taken to the chief dermatologists of Europe for examination. Cazenave, Devergie, and Gibert, of Paris, and also Hebra and Sigmund, of Vienna, declared her, though leprous, not liable to convey the disease, and, with their certificate, the woman returned to Samos, where she has lived freely among her kindred and friends for twelve years without conveying the disease to any one. 2. A handsome young lady of good family fell in love with a leper and married him. She has lived with him eight years. Partly through jealousy on his part, and partly through devotion on hers, they made every effort to share the leprosy in common. The leprous husband caused her to kiss his ulcerated tongue constantly, and numerous attempts at inoculation were made. Nevertheless, the husband finally died of leprosy, while the widow still lives in perfect health!

In Cyprus, leprosy is now as prevalent as before the English occupation. Heindestan, the medical inspector of the island, has introduced numerous reforms, and the lepers are well cared for. Heindestan reports the case of a rich leper who seduced a young girl and conveyed the disease to her. Fortunately, the disease was cured by the employment of Donovan's solution! As Zambaco says, the patroness of the Isle of Cyprus, perhaps, had more to do with this case than leprosy.

One more case may be cited from Cyprus. A woman born of leper parents was married to a healthy man twenty-two years ago. Later, she became leprous and had a leprous son. Her husband then repudiated her, and she sought refuge in the leper asylum, where she had relations with a healthy man from a village in the neighborhood. Becoming pregnant, she quitted the asylum and was clandestinely delivered of a girl, whom she abandoned at a church-door. The infant was adopted by a respectable family having no lepers nor leper acquaintances. The child arrived at the age of 10 without having seen a leper. She then began to show signs of leprosy, and was sent to the asylum at the age of 14. The father of this leper girl remained well. During the time she remained in the family of her adoption she conveyed the disease to no one. In conclusion, Zambaco gives a *résumé* of his opinions on leprosy, referring first once more to the fact that he has never personally seen a case of contagion. In numerous mixed marriages coming under his observation he has never seen the disease transmitted from one party to the other. Often, a single member of a family is a leper, and yet mingles without restraint with the others, adults and children. Nurses and attendants in leper hospitals, often religious devotees, care for lepers and live in their midst for years without contracting the disease.

Leprosy is hereditary in the East. It often skips one generation and shows itself in the next. It rarely appears in large cities. Misery, dirt, and bad food, especially decomposed fish, oil, etc., also excess in alcoholic beverages and overwork, are potent causative factors. Zambaco also believes that extreme humidity and sudden changes in temperature are also influential. Leprosy, he thinks, is only contagious in certain localities and in extremely rare cases.

Arning[69, July 4] showed, at a meeting of the German Dermatological Society, some specimens, casts, etc., and gave an account of his apparent success in inoculating leprosy in man. Thirty recorded cases of human inoculation, he said, had given negative results. Arning inoculated an Hawaiian criminal with fresh lepra tubercle on September 30, 1884. Lepra bacilli could be found at the point of inoculation during the course of sixteen months following. Four weeks after inoculation rheumatoid pains set in in the inoculated arm, lasting five months. During this time a painful swelling of the median and ulnar nerves showed itself, but this also disappeared within the first six months. As late as the summer of 1886 no symptoms of lepra had appeared, but by September, 1887, undoubted tubercular leprosy had appeared in the patient. In 1888 this was rapidly growing more severe, and when last heard from, in 1889, the patient was slowly dying of marasmus. Arning, with a scientific reticence which does him credit, admits that this case does not absolutely prove the contagiousness of lepra, though it certainly points in that direction.

Wyndham Cottle[2, July], reports a case of the cure of leprosy in a man born and living during his youth in England. He lived twenty-four years in Jamaica, returning to London in November, 1877. The first sign of (anæsthetic) leprosy was observed in May, 1878. A tonic treatment was at first employed, and in September, 1878, chaulmoogra oil, at first in small doses, later increased to 20 minims (1.23 cubic centimetres), three times a day, was given for about six months. The patient improved at first, but later suffered a relapse, and when Cottle first saw him he showed tubercular and ulcerative lesions as well as anæsthetic areas. Cottle placed him on drachm (3.90 grammes) doses of chaulmoogra oil thrice daily. In four months he was much improved, and Cottle reported the case.[2, June, 79] The patient has been kept under observation ever since. He continued to take the oil in diminishing doses, and to apply it freely to the affected parts. In 1888 all symptoms of active disease had disappeared, except a slight brownish staining on the backs of the hands and some loss of sensation about parts of the legs and feet. His general health was excellent. In other cases the treatment has failed, but none could take as much chaulmoogra oil (90 millimetres—5.54 cubic centimetres) at one time as this patient.

Chaulmoogra oil has also been used in India by Mouat[6, Aug.], with success. The plant, he says, "appears first to have been described by Roxburgh, in the 'Flora of India,' under the name of *Chaulmoogra odorata.* The following is the account of it given by that excellent and accurate observer: 'Chaulmoogra and Petakura are the names of this tree and of the drug, hereafter mentioned, which it furnishes. It is indigenous in the Sylhet district, and grows to a large size, equalling the largest mango-trees, and when full grown may be compared to the great maple or sycamore—*Acer pseudoplatanus.* It blossoms in April and May, and the seed ripens about the close of the year; when the fruit is gathered, the seed is carefully taken out, dried, and sold to the native dealers in drugs at about 5 rupees the maund of 84 pounds (42 kilogrammes). The seeds are employed by the natives in the cure of cutaneous diseases. When freed from the integument, they are beaten up with clarified butter into a soft mass, and in this state applied thrice a day to the parts affected.'

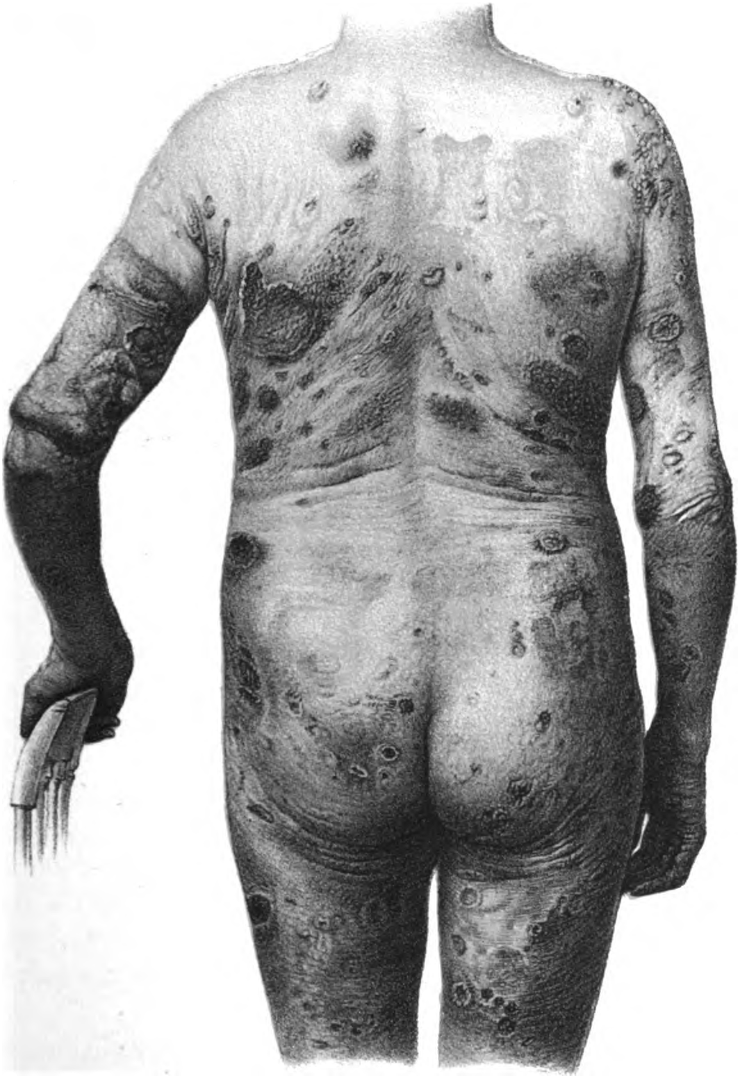
"It is placed in the Order CIX, Pangiaceæ, which are thus described[1117, p. [illegible]]: 'Trees: Leaves alternate, stalked, entire, or somewhat lobed. Flowers axillary, solitary or fascicled, or, in a few flowered racemes, ♂ ♀. Sepals 5, rarely 2, 3, or 4. Petals 5, rarely 6. Scales as many, opposite the petals, ♂. Stamens 5 or ○ ○; not a rudiment of ♀. ♀ sterile; stamens equal in number to the petals, rarely more. Ovary free, 1-celled; ovules ○ ○, attached to 2-6; parietal placentæ. Capsules succulent, indehiscent, 1-celled. Seeds ○ ○, large; albumen abundant, oily; embryo nearly as large as the albumen; radicle protruded; cotyledons generally leafy and veined (Bennett)." What the distinction is between these plants and Papayads, except that the last are monopetalous, and have no faucial scales in the ♀ flowers, it is hard to say. Bennett throws no light upon the matter. The species are found in the hotter parts of India. All are poisonous plants. The seeds yield by expression a bland fixed oil, with a peculiar and slightly unpleasant smell and taste, with the faintest possible after-flavor of the bitter almond. The oil procured from the bazars is invariably impure, but Mouat has not ascertained with what other matters it is adulterated. It appears to have been long known to and prized by the natives in the treatment of leprosy, and few of the fakirs traveling about the country are unacquainted with its properties. He was first informed of its value by Mr. Jones, the head-master of the Hindoo College, a gentleman of eminent acquirements, who brought it to the notice of other practitioners in this city, and at whose recommendation it was tried in the leper asylum with a favorable result.

Mouat reports 1 severe case of ulcerated tubercular leprosy where the ulcers were cleansed and dressed daily with the oil, while the patient took a pill of the seed beaten into a pulp to the amount of 6 grains (0.39 gramme) three times daily. In two weeks the patient began to improve; the ulcers healed and, though not cured, the progress of the disease has been for a long period (how long I cannot make out from Mouat's report, but it seems thirty-seven years !) stationary.

Dreckmann $^{4}_{\text{Apr.20}}$ reports the cure of a Brazilian leper by Unna's method. Both legs and feet were rubbed with a 10-per-cent. pyrogallic-acid ointment, and the rest of the body with a 10-per-cent. chrysarobin ointment, twice daily. The face was covered with a strong creasote-plaster mull once a day, the jaws, however, being painted with zinc gelatin. Later, the larger tubercles were cut out and the patient given ichthyol internally. The patient recovered by the end of two or three months.

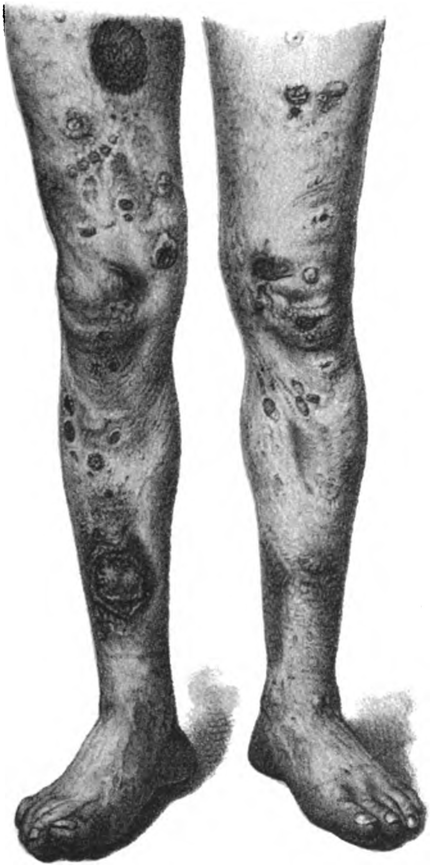
Mycosis Fungoides (*Granuloma Fungoides*).—Dorritz and Lassar $^{20}_{\text{B.116,p.301}}$ describe a case of this curious and striking disease. The patient was a man 57 years of age. The only history which could be obtained was that tumors had begun to appear on his body four years previously. On examination a great variety of lesions were observed. On the left temple was a scaly eczemaform patch on a red base; on the right cheek two papular elevations; on the right eyebrow a scaly, crusted patch of inflammation. At the left commissure of the lips was a circinate lesion made up of papules. A similar circinate patch, covered with brownish-red papules, could be seen below the jaw. Reddish-brown patches of various sizes were situated about the shoulders. On the right arm were two ulcers covered with thick, rupia-like crusts. Near the axilla was a subcutaneous tumor. Large, flat elevations, several inches in diameter, rising ½ inch (0.013 metre) or more abruptly from the skin, but sunken and ulcerated in the centre, were observed at several points. This extraordinary and multiform eruption resembled in places eczema, in other places syphilis, with more or less likeness to various other skin affections. (See lithographic plates.)

Although the eruption was by no means regarded as in any way related to syphilis, even the ulcerative lesions healing without a scar, Lassar employed mercury and iodine internally. The effect was at first striking. The milder lesions healed up. The pruritus, which was a striking symptom, disappeared, and even the ulcerative lesions began to heal rapidly. Unfortunately, the improvement was only temporary. In spite of the hypodermic injection of mercury, with iodides by the stomach, new lesions began to



Mycosis Fungoides. (Dönitz & Lassar.)
Virchow's Archiv.

Burk & McFetridge Lith. Phila.



Mycosis Fungoides. (Dönitz & Lassar.)
Virchow's Archiv.

Burk & Mc Fetridge

form, while the older ones took on fresh growth; gangrenous patches appeared, and, in spite of arsenical injections, which seemed to do good in a similar case of Köbner's, the patient sank into marasmus and died. Post-mortem examination showed no disease of the internal organs. No bacillus could be made out, and experiments in transferring the disease to animals failed. The authors conclude that while, histologically, the affection is a sarcoma, yet its clinical appearances are so different that it must be considered an independent disease.

SYPHILODERMATA.

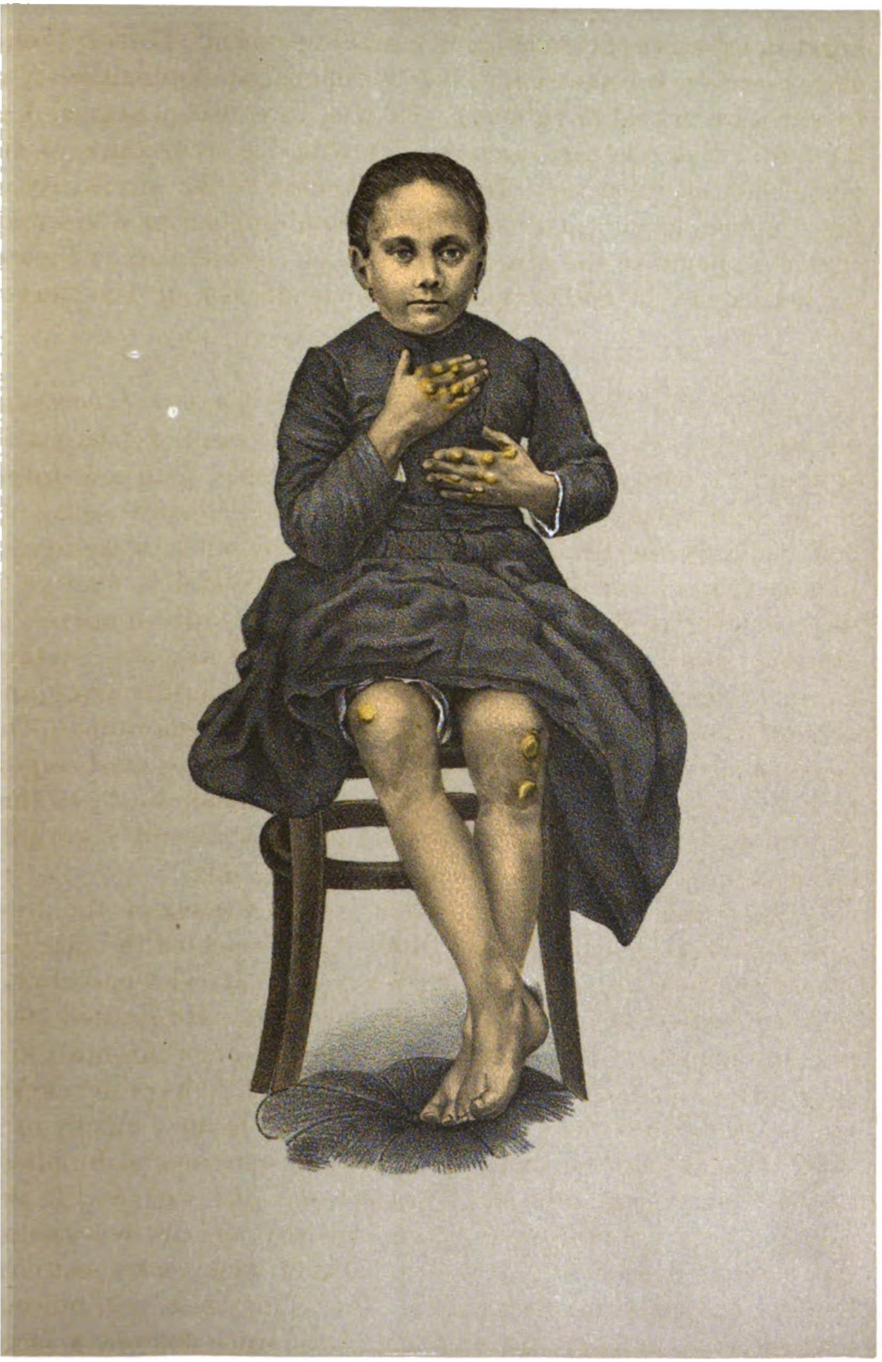
A Late Erythematous Syphiloderm.—Fournier$^{607}_{\text{June}}$ has lately drawn attention to the appearance, in the later periods of syphilis, of rounded, oval, or irregular patches of a brownish-pink color, fainter or even quite decolorized toward the centre, very superficial, not elevated, and having the form of an erythema with pityriasis, to which he has given the name of "*roseole tardive.*" Vidal and Besnier have also seen a few cases of this rare affection. They agree with Fournier in considering it extremely rebellious to specific treatment. In a typical case the lesions were about twenty in number, scattered over the trunk, and especially under the axilla and on the arms. They varied from 1½ to 2 inches (0.038 to 0.051 metre) in diameter, with irregular oval or circular, tolerably well defined margins standing out by their rose color from the surrounding healthy skin. The surface of the patches is of a rose color, forming a true ring. The patches are never elevated; the finger passed over the skin at their level does not feel any irregularity. There is slight desquamation and no itching. When grasped between the fingers no infiltration or induration of tissues is felt. The red color disappears momentarily under pressure.

Neuro-Syphilides and Neuro-Leprides.—Unna$^{24}_{\text{Oct. 27}}$ describes one of those curious circinate eruptions found in late syphilis to which attention has recently been drawn by French observers, and of which we have given an account just above. Unna says that the important clinical features of this eruption are: its appearance in erythematous lesions in the latter portion of the secondary stage of syphilis; the persistent circinate appearance of the lesion without any tendency to spread, develop, or alter its position, the free central portion always remaining intact; and the entirely negative influence of external and internal treatment. The erythema may, however, become augmented or diminished spontaneously or by exposure to cold or rubbing. Of late, Unna has observed 1 or 2 cases of this affection in connection with the occurrence of the pigmentary syphiloderm. He calls attention to the similarity of this eruption to the peculiar erythema-form eruption of a circinate character, found in the anæsthetic form of leprosy, and intimates the dependence of both eruptions on some affection of the nerves.

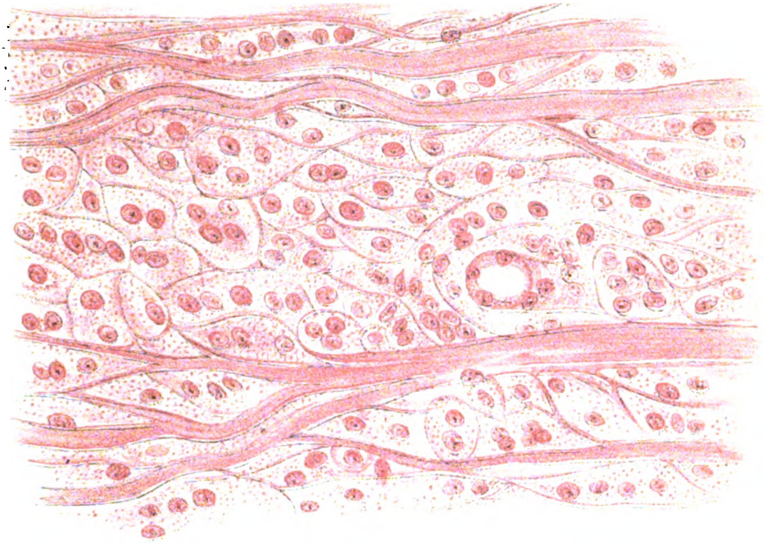
XANTHOMA.

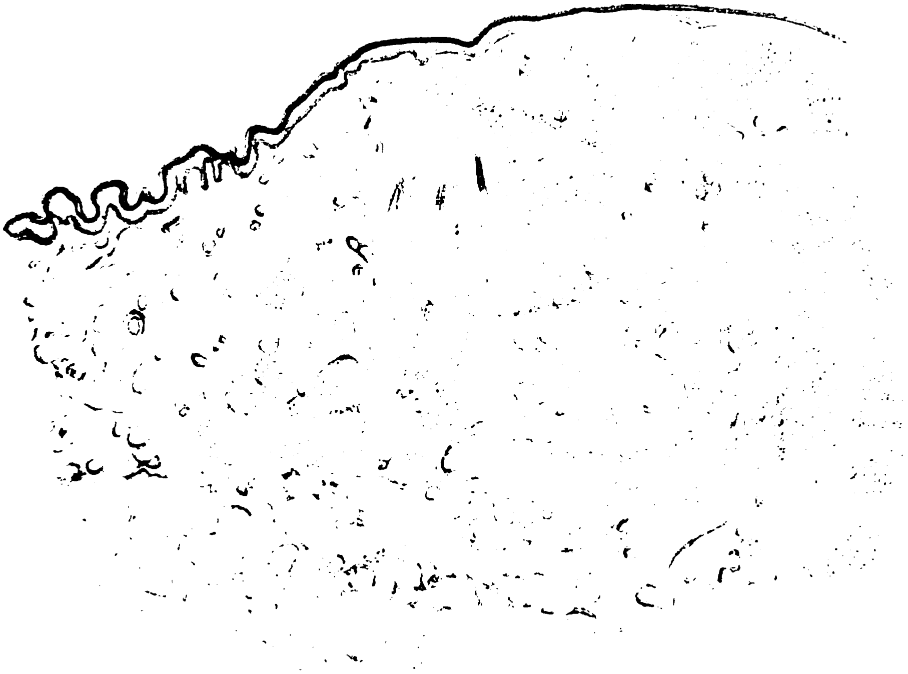
Under the title "*Xanthoma multiplex planum tuberosum, mollusciforme*"(!), Lehzen and Knauss[20 Apr.] give cases of two sisters of 9 and 11, who displayed lemon-colored patches, here and there, on the eyelids, etc., and also tumors on the heels, hands, etc. In both children the xanthoma was preceded by other skin diseases (blebs, etc.). There was no icterus in either case and no change in the parenchyma of the liver; nor was there arthritis, diabetes, or extensive disease of the sebaceous glands. The vascular system, however, was affected, shown clinically by mitral insufficiency, and also by changes in the blood-vessels observed post-mortem. The plates appended show the general arrangement of the most important of these tumors, while the microscopic examination shows that the similar tumors and growths found in the aorta and elsewhere had a similar structure to the xanthoma of the skin.

Xanthoma Diabeticorum.—At a recent meeting of the New York Dermatological Society, Robinsen[245 June] presented a case of *xanthoma diabeticorum* occurring in a man of 31, who had always enjoyed good health and was free from jaundice. He showed 1000 to 1500 tumors on the body, varying in size from a pin-head to a large pea. The majority of the lesions seemed to have developed around the hair-follicles. The tumors were located chiefly over the gluteal and lumbar regions, where there were several hundred, and on the extensor surfaces of the forearms and legs, and in the calves. One pin-head-sized tumor appeared on the left side of the nose on a level with the eyes. There were many scattered lesions over the trunk and limbs. The palms, soles, and mucous membranes were free. Examination of the urine showed a large quantity of sugar. Beyond this the internal organs were normal. The case was at first considered one of fibroma cutis. Many of



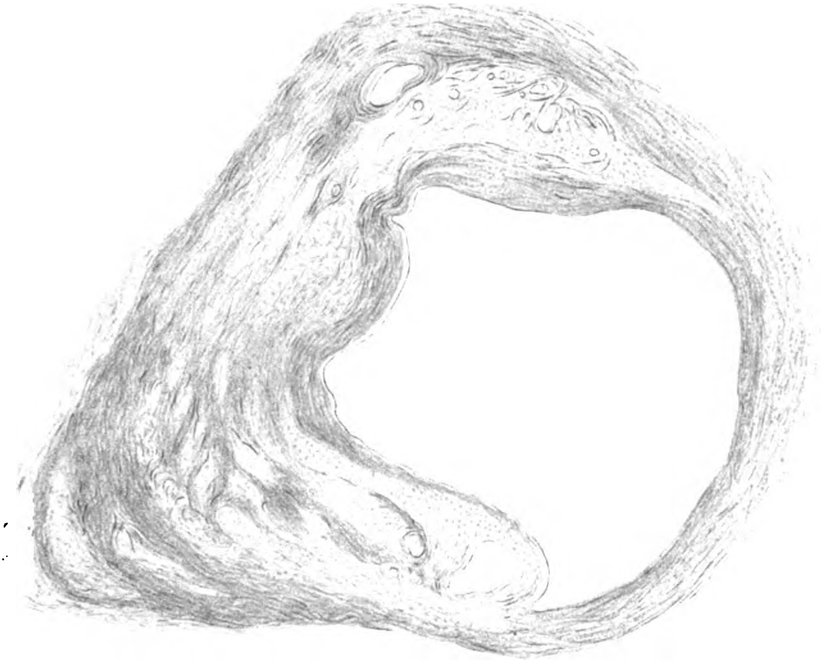
Xanthema Multiplex Planum (Lehzen and Knauss).
Virchow's Archiv.

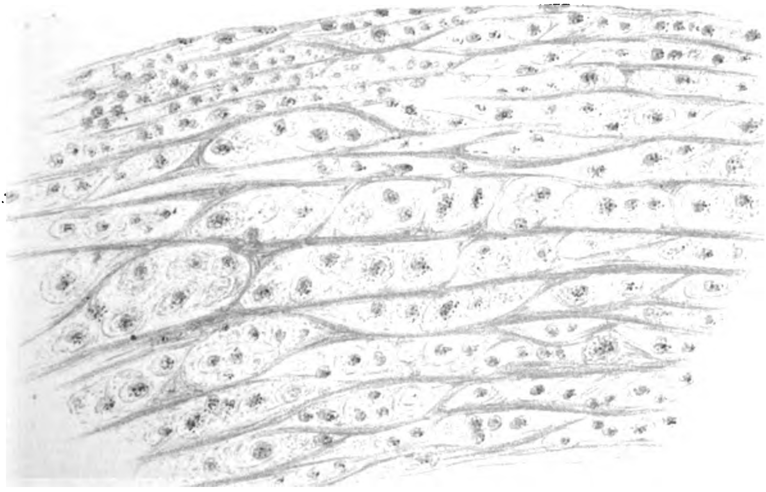




Xanthema Multiplex Planum (Lehzen and Knauss).
Virchow's Archiv.

Burk & McFetridge, Lith. Phila.





Xanthema Multiplex Planum (Lehzen and Knauss).
Virchow's Archiv.

the lesions were not yellow and many also seemed to originate from the hair-sheath. The final diagnosis, however, was xanthoma diabeticorum.

Therapeutics of Xanthoma.—Stern [4] Dec.10,'98 quotes Kaposi as saying that there is no other successful treatment for xanthoma than excision by the knife. But he differs from Kaposi's opinion. He thinks Besnier's phosphor-turpentine treatment useless. However, in one case occurring in typical form on the eyelids, Stern painted the growths with a fine camel-hair pencil moistened with a 10-per-cent. solution of corrosive sublimate, having first protected the eye with absorbent cotton. A crust formed, and, on separating, the growth was seen to have been entirely removed and without a scar. This treatment is worth a trial, but such a surprising result cannot be expected to occur soon again.

Sarcoma.—Handford [6] Apr.6 read a paper before the London Pathological Society on "Cylindroma of the Skin." Sections and drawings of a "cylindroma carcinomatodes" were obtained from the skin of the leg of a man aged 45, who had been scalded thirty-one years previously, and had twice suffered from a chronic ulcer of the cicatrix. On the last occasion the ulcer was so intractable, and so much resembled epithelioma in its aspect (although there was not much induration of the edges), that Wright, under whose care the patient was, removed a small portion of the growth and submitted it to Handford for microscopic examination. From this portion, and from the rest of the growth subsequently obtained, the sections were made. The leg was amputated at the knee-joint, and at the end of a year no recurrence had taken place. The inguinal glands were not enlarged. The growth was about ½ inch (12 millimetres) thick, 3½ inches (87 millimetres) long, and 6 inches (150 millimetres) broad. It had eroded the tibia to a considerable depth.

Many forms of new growth are included under the term "cylindroma." Some are sarcomatous, some carcinomatous, but in all there are hyaline transformations. In some the cylinders are formed by cells and in some by the hyaline material, while in others the cylinders are formed around the blood-vessels (Sattler). The present case very closely resembles the "cylindroma carcinomatodes" of Ziegler (who had only seen 1 case), the "tubular epithelioma" of Cornil, and also the "cystic epithelioma" of Rindfleisch. The mass of the growth was a squamous epithelioma, showing "bird's-nest" arrangements, but completely riddled with globular or cylindrical spaces, appearing circular on cross section, and containing hyaline material. These spaces explain the absence of the usual induration during life. Ziegler has described these spherules as "masses of colloid substance which pressed asunder the other cells of the group." Robin considers them to be "tubular epitheliomata with mucous connective-tissue growths in the midst of the epithelial mass." Handford thinks that the specimens he exhibited plainly show that the hyaline spaces, which are lined with cylindriform epithelium resembling that in the deepest part of the stratum Malpighi of the skin (a fact not hitherto observed), are produced by the downward growth of epithelium inclosing areas of connective tissue, which, as its nutrition thus became impaired, underwent a hyaline transformation; the extreme regularity of the process is its most peculiar phenomenon.

MISCELLANEOUS.

Adventitious Rashes of Typhoid Fever.—Moore$^{22}_{\text{Dec.1,'88}}$ says that these may be *miliary*, *urticarial*, or *erythematous*, leading to a wrong diagnosis of typhus, measles, or scarlatina, respectively, if the absence of the other objective and subjective symptoms of these diseases is not taken into account. The erythematous rash is the most puzzling, but the prodromata of scarlatina are absent; nor is the typical course of that disease observed. It may show itself at the end of the first week of typhoid, when it probably depends upon a reactive inhibition of the vasomotor system of nerves, or at the end of the third week, when it may be septicæmic; or it may be due to blood-poisoning, or both conditions may be present together. This rash is of diagnostic rather than of prognostic value, for its presence is not ominous, though it is apt only to occur in severe cases.

Piedra.—Renoy$^{8}_{\text{Dec.,'88}}$ has examined a number of hairs sent him by a physician of Columbia, South America, from a patient affected with "*piedra.*" The hairs are the seat of minute nodules hardly perceptible without the aid of a lens. These nodules are very hard (hence the name "*piedra*," *stone*) and hardly separable from the hair. They give rise to a sort of felting and to a crepitant sound when the hair is brushed. On examination with a high microscopic power, the nodules are found to be made up of a mass of spores resembling those of tricophyton, and covered with a glairy layer composed of bayonet-formed elements with Brownian movements. The disease is trifling; it can be cured by shaving the scalp, as it never penetrates the hair-follicles or invades the root of the hair. Renoy proposes the name *tricophytosis nodularis* instead of *piedra*, which only describes the gross appearance of the nodules.

Pseudoleukæmia Cutis.—Under this title Joseph[57, Oct. 2] describes an eruption which may occur as the result of leukæmia, and resembles the effects of this affection on the inner organs. He gave the case of a man, 66 years of age, who had suffered for two years with typical leukæmia. The lymphatic glands at all points were markedly enlarged; the skin and mucous membrane, so far as observed, were highly anæmic. Examination of the blood showed an increase of the white corpuscles with a very slight decrease of the red blood-corpuscles.

A year later an eruption appeared, which was extremely pruriginous in character, papular, and resembling prurigo. Microscopic examination showed appearances similar to those of leukæmia cutis. A typical lymph-cell infiltration, localized particularly about the sweat-glands, was found on microscopic examination. The corium also was involved, but the epidermis and rete were free. In addition to the papular eruption, certain flat patches of infiltration, movable over the subcutaneous tissues, were observed. The patient died, and the autopsy showed pseudoleukæmia lymphatica, etc. Joseph says that E. Wagner has published 3 similar cases under the title of "Prurigo in Lymphatic Anæmia."

Exfoliative Skin Affections—the Losses Suffered by the Economy in these Affections.—Quinquaud[3, Sept. 11] has made experiments with animals, inducing dermatitis, and then examining the changes in nutrition. He finds that glycogenesis remains normal, but that there is a diminution of gas in the arterial blood, particularly of carbonic acid. The oxygen of the arterial and also of the venous blood diminishes after experimental lesions. The important point, and one which should be recollected in the treatment of exfoliative dermatitis, is the failure of harmony manifested in the cellular nutrition and shown by the disproportion in gaseous contents of the blood. The vice of nutrition consists in the storing up of oxygen in the system and in the production of toxic products. The urea in the blood is diminished in quantity. After three days the animals experimented upon died of septicæmia. Aside from the accumulation of urea in the blood, which contains five or six times more than the normal quantity, the urinary secretion is less rich in urea. The renal function is therefore insufficient; consequently, uræmic poisoning results—uræmia, in other words.

If the epidermic *débris* is examined in these cases, a surprising amount of nitrogen, carbon, and sulphur is found to be thrown off. In 40 to 50 grammes (1 ounce 2 drachms to 1 ounce 5 drachms) of scales shed by a patient in one day, Quinquaud has found the loss of carbon to be considerable. The sulphur eliminated is in the form of an organic compound, as yet undetermined, but which is certainly not a sulphate. The quantity of nitrogen thus lost, as above, cannot be less than 14 to 15 grammes (3½ to 4 drachms),—an enormous proportion. Struck by the septic symptoms to which the animals experimented upon succumbed and the enormous losses above mentioned, Quinquaud thinks that the treatment should be based upon these indications. He has obtained good results in animals affected with artificial dermatitis by the employment of antiseptics, as iodol, bismuth, and iodoform. Superalimentation and inhalations of oxygen tend to combat the loss by profuse exfoliation. In the discussion following the reading of Quinquaud's paper before the International Congress of Dermatology, Vidal expressed himself as being entirely in accord with the writer as to his conclusions.

Skin Diseases of Nervous Origin.—In the course of his presidential address before the Neurological Society, Hutchinson[645, Jan. 26] gave the following three laws by which to recognize skin diseases owning an origin in some disorder of the nervous system: 1 The disease will not occur in round patches, nor in oval ones, nor in streaks, but will be arranged according to the branching distribution of the filaments themselves; it will be panniculate or corymbiform. This is a conclusive argument, in his opinion, against alopecia areata being of nervous origin. 2. There will be no power of infecting adjacent structures; the patches will not be serpiginous. Eczema, psoriasis, lupus, and many others tend to spread by extension; there is no such tendency in the case of herpes or scleroderma. 3. The diseases develop themselves fully in the first instance; the results, when once declared, do not increase. From the fact that when herpes zoster, if it occur a second time in a patient, never affects exactly the same area, Hutchinson draws the conclusion that the nerve is disorganized by the kind of neuritis which produces the original attack of zoster, and so is incapable of being involved a second time. Recurrent herpes is a different affection, for it leaves no scarring behind it, as does true zoster; moreover, it is curable by arsenic, whilst arsenic is capable of producing an attack of zoster.

Distribution of the Nerves of the Skin.—Eichhorst $^{114}_{\text{B.14,H.6,8}}$ endeavored to ascertain the cutaneous nerve-areas affected in horizontal solutions of continuity of the spinal cord (carcinoma of the vertebra, acute myelitis). He found that the line between normal sensibility and anæsthesia, in solution of continuity in the spinal cord about the dorsal region, instead of being straight around the thorax, is composed of two "curve-types," which he notes as elevations in the vertebral, scapular, and mammary regions with intervening depressions. The origin of these curves is to be sought in the distribution of the cutaneous nerves.

Perforating Ulcer of Elbow Following Neuritis.—Helbing $^{761}_{\text{B.5,H.2}}$ reports a case of this character leading to disturbance of sensation, etc., in the arm, and requiring amputation. The three principal nerves of the arm, especially the median, showed interstitial neuritis. No cause for this could be found.

Dermatitis Gangrenosa Infantum.—Moore $^{285}_{\text{Aug.}}$ describes the case of an infant of 7 months that had suffered from purpura about the back and head, attributed to bad hygiene. Having recovered from this, it had, thirteen days previously, been attacked by small, red spots on the buttocks and thighs, with swelling of the scrotum. Two days later it was seen and an ointment applied to the sore places, which soon became raw and ulcerated. Moore did not see the child until after death, which appears to have occurred from exhaustion on the thirteenth day. He then found punched-out ulcers of irregular shape, 1 to 1½ inches (0.025 to 0.038 metre) in diameter, from which slough had separated. The intervening skin was red and infiltrated.

Frambœsia (Pian).—Under the title of "Pian or Lepian in the Antilles"—"Dermatitis Papulo-Frambœsioides," Lacaze gives a full description of this curious tropical disease. It is unknown whether the disease originated in Europe, Africa, or America. It is contagious, but does not recur in the same patient when properly treated. Pian is particularly common in Guiana, Dominica and the Antilles. In the localities where the disease is endemic it is held in such horror that even physicians are afraid to treat it (*sic.*) Lacaze having, during a visit to Pointe-Noire, obtained permission from Ravel, the director of the small special hospital at that place, to study the cases there, gives the following descriptive points: The place of election is the muco-cutaneous junctures, as the commissures of the lips, also the chin, the external prepuce, the labia majora, and the anus. The earliest lesions are small, pruriginous, reddish vesico-pustules, which occur in successive outbreaks, gradually enlarging, and showing a round, papular elevation with a scirrhous, grayish aspect. Left without treatment, the lesions extend by growth, and are propagated by contagion to other parts and also to other individuals, especially the children of a family. When the disease has lasted a long time the disease (or parasite, as Lacaze prefers to call it) seeks the neighborhood of the articulations and penetrates to the bones, which become fungous. Ulcers of large size then form and display the bone. The treatment of pian consists, in the first place, in cleanliness. It only occurs among careless and dirty people. Later, mercury and iodine internally, with mercurial ointments locally, are called for. The extremely nauseous odor of the secretion is to be combated by lotions of carbolic acid. Taken at the beginning, pian is readily cured. The trouble with the natives of the Antilles is that they are very dirty, unlike the inhabitants of the warm countries of the Orient, who make cleanliness a religion, and they are also averse to medical treatment of any kind. Pian, though closely resembling syphilis and often found side by side with that disease, is, however, says Lacaze, distinct. (Unfortunately, however, he does not give data for a differential diagnosis, and I am inclined to think that his description would fit those forms of papulo-erosive and ulcerative syphilis where dirt and heat cause the growth of vegetations or warts.) In a recent clinical lecture, Kaposi[57, Mar. 3] takes the same or a similar view. Lecturing on a case of frambœsia he demonstrated that it was implanted, in that instance at least, on a ground of lupus vulgaris.

THERAPEUTICS.

Salol.—Schwimmer[8, Feb. 2] says that *resorcin*, *bismuth subnitrate*, *pyrogallic acid*, and *salicylic acid* have, one after another, been tried as local applications in ulcers, particularly in chancroid, but have failed to find general acceptance. Iodoform is the most satisfactory of all local applications. It causes rapid granulation, but only very slow cicatrization. Its disagreeable odor is objectionable to an extreme degree. Schwimmer has tried salol as a substitute for iodoform in a great number of cases. He finds that it limits suppuration without entirely suppressing it, and hastens the formation of cicatricial tissue. He therefore recommends its use in all kinds of venereal sores, syphilitic and non-syphilitic. It is painless, prevents phagedenic ulceration, and, though not so rapid in its effect as iodoform, presents no marked superiority over the latter. *It has no disagreeable odor.* It should be applied in powder with 2 parts of starch, or in the form of ointment. He does not recommend its internal employment.

Dermatitis.—Casati, according to our correspondent, Ducrey, of Naples, Italy, recommends, in extensive superficial burns, the carron-oil application containing 5-per-cent. creoline. The latter is one of the first-class antiseptics, and has the advantage of not being poisonous, even in large doses. He also recommends massage of the healthy and surrounding parts. The reasons given, however, do not seem adequate. The addition of creoline, however, certainly seems reasonable.

Hyperidrosis.—A 5-per-cent. solution of chromic acid, applied with a brush to the previously washed and dried feet, is the treatment which has proved successful in 18,000 Prussian soldiers. The acid seems to harden and strengthen the skin; the moist and reddened portions become dry and smooth-looking, and the fetid sweat quickly disappears. In many cases three or four applications effected a permanent cure.[9, July 6]

Lupus vulgaris has been twice cured by Hanssen[336, Sept. 7] by scraping and the application of ice, the time occupied being a few weeks only.

Pruritus.—Eloy[297, No. 73] recommends menthol as an antipruritic. He employs a solution of 1 to 3 parts menthol in 50 parts alcohol, or the following liniment: ℞ Menthol., gr. x (0.65 gramme); olei olivæ, lanolin., āā ℥ss (15.5 grammes).—M. In stubborn cases (of eczema, urticaria, pruritus senilis, etc.) it may be necessary to increase the strength of menthol to 10 or 15 per cent. In chronic eczema Eloy uses the following ointment: ℞ Menthol., gr. x ad xx (0.65 ad 1.30 grammes); bals. Peru, gr. xxx (1.95 grammes); lanolin., ad ℥j (31 grammes).—M.

Burns.—Ostermayer[69, Oct. 10] says that while iodoform quiets pain in burns it does not stay suppuration. He recommends a powder of *potassium sozoiodol*, a recent antiseptic, mixed with starch or talc-powder in 10-per-cent. strength. This has no odor, and prevents suppuration. Moreover, it is non-poisonous,—an advantage which it has over carbolic acid as well as iodoform.

Anthrarobin.—This drug,[152, Aug. 18] a product of alizarin, proposed several years ago by Liebermann, of Berlin, as a substitute for pyrogallic acid and chrysarobin, is still the subject of therapeutic experiment. It is a yellowish powder, slightly soluble in water, very soluble in warm glycerin, in alcohol, and in dilute alkalies. It is a strongly "reducing" agent. Behrend and Liebermann treated 15 cases of psoriasis, 17 of tinea tonsurans, 2 of erythrasma, and 1 of tinea versicolor with this drug, all with satisfactory results. It appears to be midway in action between pyrogallic acid and chrysarobin. [I used it in a similar series of cases, but found that the drug had all the disadvantages of discoloration, etc., attending the use of chrysarobin, while in activity it seemed scarcely the equal of pyrogallic acid.] Bronson, of New York,[245, Nov., '88] says that the irritant action of anthrarobin does not extend beyond the locality of its application, and that it also has the advantage of being non-toxic. The action of the drug is intensified if the skin has previously been bathed in alkalies. In one case of "eczema seborrhœicum" Bronson got a cure, when all else had failed, by the employment of a 10-per-cent. solution of anthrarobin in alcohol or collodion. Schwimmer[84, Nos. 3 to 5, 8] got the best results from anthrarobin in the treatment of the vegetable parasitic diseases of the skin. The patient's underclothing, however, is destroyed by staining.

Oxynaphtoic Acid.—Schwimmer[84, Nos. 3 to 5, 8] has employed this remedy in combination with sodium. It is a white, inodorous powder, nearly insoluble in water, soluble in warm glycerin, essences, and oils. As an antiseptic it is five times as active as salicylic acid. Schwimmer has used it in venereal diseases, scabies, and other parasitic skin diseases, and in prurigo. The following formula is employed in scabies:—

℞ Acid. naphtoïci,		
Cretæ albæ,		
Saponis viridis,	ãã ʒj	(3.90 grammes).
Adipis,	℥j	(31.00 grammes).—M.

This preparation produces no toxic effect even in children. It kills the acarus in three or four days, but the eczema left behind requires treatment.

Vidal's "*red plaster*" is composed as follows[245]:—

℞ Minium,	gr. c	(6.5 grammes).
Cinnabar,	ʒj	(3.9 grammes).
Empl. diachyli,	℥ij	(62.0 grammes).—M.

This is to be spread upon fine linen so as to make a sort of adhesive plaster, which may be cut into pieces the size of the lesions to be covered. It is to be changed every twelve to twenty-four hours, according to the abundance of suppuration.

Acne:—

℞ Hydrarg. iodochloridi,	gr. xxiv	(1.5 grammes).
Axungiæ,	℥ss	(15.5 grammes).—M.

Rub in vigorously. The local action of this remedy is said by Gailleton,[14, July] its author, to be "very energetic." It should, therefore, be used at first with caution.

Pruritus[14, July]:—

℞ Menthol.,	gr. xv to xlv	(0.97 to 2.90 grammes).
Alcohol.,	f℥xiiss	(48.50 grammes).—M.
Wash.		

℞ Menthol.,	gr. xlv to ʒiiss	(2.92 to 9.75 grammes)
Ol. olivæ,		
Lanolini,	ãã ℥j	(31.00 grammes).—M.
Liniment.		

℞ Menthol.,	gr. xlv	(2.92 grammes).
Bals. Peru,	℈iv	(5.20 grammes).
Lanolini,	℥j	(31.00 grammes).—M.

Hydroxylamin in Dermatology.—P. J. Eichhoff,[28, Jan.1] recommends this substance for the treatment of skin diseases. It occurs in the form of colorless hygroscopic crystals, easily soluble in water, alcohol, and glycerin. It is an active "reducing" agent, forming in the blood methæmoglobin. It produces hæmaturia by destroying the blood-corpuscles when introduced into the blood in doses exceeding 1 centigramme (0.15 grain) for each kilogramme (2 pounds) of the animal. Besides, it acts as a narcotic on the nerve-centres. Because of its pronounced reducing qualities this substance recommends itself as an excellent topical application in the vegetable parasitic skin diseases. Eichhoff especially recommends the chlorhydrate in the following formula:—

℞ Chlorhydrate of hydroxylamin, . $\frac{1}{10}$ grain (0.006 gramme).
Alcohol or glycerin, ... 50 grains (3.24 grammes).—M.
For external use.

After washing the affected portions of the skin with soap, they are painted from three to five times daily with the alcoholic solution of hydroxylamin. This alcoholic solution being very irritating and poisonous, at the beginning no stronger solution than 1 to 1000 should be used, and not until later, when no harmful secondary symptoms have developed, may a stronger solution be resorted to. Eichhoff treated in this way 5 cases of lupus vulgaris, 5 cases of tinea tonsurans, and 1 case of parasitic sycosis of the face. The results were especially encouraging in lupus. After eight days of treatment a reduction of the hypertrophied portions was noticed, and a cure, with smooth scar, was effected inside of four weeks. In tinea tonsurans the hydroxylamin at first greatly irritates the skin, but the final result is none the less satisfactory. The author intends to use the substance also in other diseases, such as psoriasis.

A Method of Treating Pruritus and Irritable Skin.—Porter$^{2}_{\text{July 27}}$ says that pruritus, whether occurring as an accompaniment of some other affection, or manifesting itself as a symptom without tangible cause, not infrequently taxes all the physician's resources for its relief. In 3 cases under his care, he used, with good results, a cone composed of cacao-butter impregnated with 2 per cent. of cocaine. This was rubbed over the part affected. The warmth of the skin melted off a layer of the cacao-butter, which formed a soothing emollient shield over the irritable patch.

The remedy has been put up in the form of cones, inclosed in box-wood cases with screw-tops, something after the manner of menthol cones. These can be carried about by the patient, ready at any moment for self-application. The box-wood, being a non-conductor of heat, prevents the heat of the body from melting the cone whilst it is carried in the patient's pocket.

The Treatment of Bunions.—Wash the feet with soap and water and then dry them. The healthy skin surrounding the bunion is protected by means of a layer of flexile collodion, and the bunion is then saturated with crystallized carbolic acid, melted by the aid of heat. The superfluous acid is dried off with a little wool or bibulous paper. The application may require to be repeated at intervals of three or four days, and one or two applications generally suffice to effect a cure.[25 Mar.]

Treatment of Purpura Hæmorrhagica by Nitrate of Silver.—Poulet[67 May 30] relates 2 characteristic and severe cases of purpura hæmorrhagica which promptly recovered when nitrate of silver was given internally. The first was that of a boy, 12 years of age, with a family history of tuberculosis and albuminuria, who, eight days previously, had been attacked by a petechial eruption, culminating in profuse epistaxis, which rapidly reduced him to an exsanguineous condition. Poulet ordered perchloride of iron and the acid infusion of roses, and, as this did not check the hæmorrhagic tendency, he followed it up on the following day by plugging the nostrils and giving subcutaneous injections of ergotin. The bleeding, however, continued as before, and the condition of the patient became critical. He then resorted to nitrate of silver, in doses of $\frac{1}{5}$ grain (0.013 gramme) twice a day, incorporated with bread-crumb and given after food. The next day a manifest improvement had taken place, and in the course of three or four days the drug could be discontinued. The lad gradually recovered, but the loss of blood had been so abundant that it was years before he ceased to be delicate and anæmic. The second case was that of a young woman of 20. Eight days after her last menstrual period purpuric spots made their appearance, with frequent attacks of bleeding from the nose, stomach, and bowels. She was fairly well nourished, and lived in the open country. Her previous health had been good, but for some weeks past she had experienced a feeling of lassitude with loss of appetite. The eruption was most marked at first on the lower extremities, but soon became general. Various antihæmorrhagic remedies were tried, but without any marked effect on the bleeding. Slight albuminuria. Legs a little puffy. Under these circumstances Poulet ordered $\frac{1}{8}$ grain (0.008 gramme) of nitrate of silver in a pill three time a day. The effect was so marked that within four days sight and hearing were restored, and the purpuric patches began to fade. The hæmorrhages ceased after the first day of the exhibition of the nitrate. Twelve pills in all were taken, and they sufficed to effect a cure.

Treatment of Lupus by Carbolic Acid.—According to F. Semeleder, of Mexico,[673 Oct.] our corresponding editor, Cordero reports 3 cases of lupus of the face cured by atomization of a 10-per-cent. solution of carbolic acid, daily, for fifteen or twenty minutes, locally, after which the part is covered with a dressing of the same solution. Within ten or fifteen days cicatrization begins, and the cure is completed. He explains it by the antibacterial effect of the acid. The author believes that the same beneficial effect might be obtained in cases of epithelioma.

Sulphurous-Acid Gas in Favus.—Schuster, of Aix-la-Chapelle,[28 B.9, No.1] in a paper on the treatment of favus, describes the treatment he has adopted in place of the old one, which, after months of application, is so often unsuccessful. He applies sulphurous-acid gas to the affected head in the following ingenious way: A net of strings is made across the lower third of an open card-box cylinder, which is fitted to the head like a hat, and which can be closed by a cover of the same material. A saucer containing burning sulphur is passed through the open top and laid on the net of strings, and the whole covered up and hermetically sealed. The patient must sit still for half an hour. The whole cylindrical space is filled with sulphurous-acid gas, which does not pass off even in that space of time, though the sulphur itself is, of course, extinguished after all the oxygen has been used up. The treatment is repeated daily, and a favorable effect is always observed after a few sittings, while in from six to eight weeks the head is free from favus, presenting in its place smooth, white, bald patches. The hair must, of course, be cut short, and the scabs softened with oil and removed, and the whole head washed with soap. Schuster believes the same treatment would be found suitable for ringworm.

Tattoo-Marks.—Brocq[245 V.7, No.78] states that, *à propos* of Variot's communication to the Society of Biology, Dupuy said that in the islands of the Indian Archipelago they cause tattoo-marks in Europeans to disappear by practicing a new tattooing with the juice of the *carica papaya.* The operation leaves no cicatrix, and takes away red tattoo-marks as well as the blue ones.

Among recent formulæ for the treatment of fetid sweating of the feet, Bardet[100, July] recommends the following:—

℞ Pulv. talcis, ...	ʒx	(38.80 grammes).
Bismuthi subnitrat., . . .	ʒxj	(42.70 grammes).
Potas. permanganat., . . .	ʒiij ℈j	(13.00 grammes).
Sodii salicylat., ...	ʒss	(0.26 gramme).—M.

To be sprinkled inside the soles of the stockings. The feet should be washed night and morning and afterward rubbed with alcohol. Unna recommends bathing the feet at night in water, to which vinegar, mustard, or spirits of camphor have been added, and subsequently inunction with the following:—

℞ Ichthyollis,		
Terebinthinis, . . .	āā	ʒij (7.80 grammes).
Ung. zinci oxidi, ...		ʒij (7.80 grammes).—M.

During the day the following powder is to be dusted in the stockings:—

℞ Pulv. sinapis, ...	gr. xv	(0.97 gramme).
Pulv. talcis, ...	℥j	(31.00 grammes).—M.

Ichthyol.—Kopp[34, Aug. 27, Sept. 3] refers to the limited number of internal medicines which have gained reputation in the treatment of skin diseases. Arsenic, mercury, the iodides, carbolic acid, quinine, pilocarpine, and atropine about exhaust the list. Of course, there are those general remedies which affect the skin by improving the nutrition. Among the latter may be mentioned sulphur and its preparations, which have been employed for ages, although up to the present time no satisfactory theory of the *modus operandi* of this remedy has been brought forward. In addition to the now well-known external use of sulphur (in 10-per-cent. ointment with vaseline) in alopecia furfuracea, squamous eczema of the scalp, eczema seborrhœicum, slight cases of disseminate acne, and psoriasis, Kopp has found calcium sulphide, given internally, of value in chronic acne, and also recalls the recognized value of sulphur mineral-waters, internally and externally, in general idiopathic furunculosis and psoriasis. With his views on the value of sulphur, Kopp hailed with pleasure the introduction of a soluble sulphur preparation, ichthyol, whose loudly-trumpeted advent has not, however, been followed by an equally permanent reputation. Though he has not found the sanguine statements of Unna and other enthusiasts, as to the wonder-working effects of the external use of ichthyol, borne out by his personal experience (as who has?), he is inclined to consider it an internal remedy of decided value. Unfortunately, we cannot be sure as to the chemical composition of ichthyol, in spite of the statements of Baumann and Schotten. It appears, however, that the combination of sulphur with carbon in a soluble form is the chief though, perhaps, not the only valuable constituent of this complex product. Zuelzer,$^{28}_{\text{No. 12, '88}}$ as well as Kopp himself, has already shown the influence which ichthyol exercises on the tissue-change and nutrition of the economy, and Kopp intimates the probability of an "antimycotic" effect from the internal as well as the external use of the remedy. In *erysipelas* Kopp's experience with a 30- to 50-per-cent. ichthyol ointment has confirmed the value of the remedy as asserted by Unna and Nussbaum. Spread on rags and used to cover the affected area and extend a little beyond, this ointment cured 4 cases of facial erysipelas in two or three days and 5 other cases in five or six days.

In *burns* and *frost-bites* the author has obtained very good results with ichthyol. In frosted fingers and chilblains a 20-per-cent. ichthyol-lanolin ointment proved useful. In erythematous burns a daily application of an 11-per-cent. solution (in water ?), in bullous burns a 20- to 30-per-cent. lanolin ointment, proved useful. In *acute eczema* he has failed entirely to get the strikingly good results reported by Unna. In a few cases the application seemed to do good, but he cannot make out what the indications are for its satisfactory employment. The same was the case regarding chronic eczema. But Kopp thinks the internal use of ichthyol as a reconstitutive and tonic is of great value in anæmic and dyspeptic individuals suffering from eczema. In *prurigo* and *pruritus* ichthyol has seemed to him to be of little service, but he suggests further trials in the last-named affection. In *pityriasis capitis* Kopp thinks the external use of ichthyol unsatisfactory, but he has gotten some good results from its internal administration. In the after-treatment of patches of *lupus vulgaris* which had been scraped the author got no good results, in spite of Unna's recommendation of this drug. The same was the case as regarding pointed condylomata. After painting these for days no good result was obtained; in fact, no visible effect of any sort. He thinks that ichthyol cotton and ichthyol plaster have some value. The cotton is a slight styptic, and under the plaster superficial wounds heal antiseptically, *Galvanism in the Treatment of Vegetable Parasitic Skin Diseases.*—Wessinger[245, July] returns to this subject first broached a year or two ago by Reynolds, but which, as Cantrell has pointed out, is by no means the success which its originators had hoped. The author says that a battery having a large number of small cells is to be preferred, and he is very particular as to having the exact dosage of the current, insisting upon the use of the milliampèremeter for this purpose. Fifteen to twenty milliampères is the proper strength for the current. The application should be kept up from ten to twenty minutes, and the fluid to be used is a 1 to 1000 or 1 to 500 bichloride-of-mercury solution. The positive electrode should be moistened with the solution at intervals of two or three minutes. The whole diseased surface should be gone over every day. He reports 1 case of favus, 2 of tinea circinata, and 1 of tinea tonsurans cured by this treatment. [I think it a pity that Wessinger did not try the treatment in more cases before rushing into print. The bichloride solution alone would be enough to cure many cases. Reference is made to Reynolds's but none to Cantrell's *critique.* This is not scientific.]

Petroleum Soap.—Vergely[188, July 14] gives Constantin Paul's formula as follows: Castile soap, 100 parts; alcohol and petroleum, of each, 50 parts; wax, 40 parts. The soap thus made is soft and has a disagreeable odor. Vergely adds a little talc to make the soap firmer and "essence of mirbane" to perfume it. Paul thinks this soap is as good as a sulphur ointment for the cure of itch. Other substances can be incorporated with this soap. An iodoform soap would be very good for the destruction of pediculi pubis, as it is known that a covering of iodoform gauze, firmly bound on, will cause the death of the pediculi. Venot used at one time a mixture of equal parts oil of sweet almonds and petroleum in scabies, with excellent results as regarded the parasite, but in some individuals an obstinate dermatitis was excited by the remedy.

Treatment of Burns and Scalds.—Illingworth, of Accrington, Eng., our correspondent, has had excellent results with an emulsion of saturated solution of borax and linseed-oil, in equal parts, constantly applied until the sloughs separate. When the raw surface is clear and the usual intense and agonizing pain sets in, nothing relieves like cocaine applied in solution of any strength.

The best dressing at this stage he has found to be the ordinary oxide-of-zinc ointment.

Whitlow.—Gaucher,$^{61}_{\text{May 26}}$ in writing on the abortive treatment of whitlow, states that, to effect this object, it is sufficient to moisten slightly the painful part and around it with a little water, and to pass over this surface a stick of nitrate of silver. In a few hours afterward the skin becomes black, all pain disappears, and the inflammation is arrested. No dressing is required and the black color disappears in six days. The author relates that in a case of the fit of the gout the great toe was much swollen and painful to the touch, rather red, and was the seat of lancinating pains which prevented the patient from sleeping. The toe was painted as above described, and the next day it diminished in size; the pain completely disappeared a quarter of an hour after the painting, and the patient got up and attended to his occupation.

OPHTHALMOLOGY.

By CHARLES A. OLIVER, M.D.,

AND

GEO. M. GOULD, M.D.,

PHILADELPHIA.

CONGENITAL ANOMALIES, EMBRYOLOGY, AND HISTOLOGICAL ANATOMY.

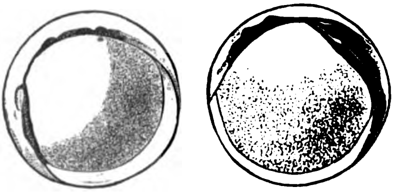
A PECULIAR case of *dermoid tumor*, with rudimentary development of the eye, has been carefully studied microscopically by Wagenmann.[204 Oct.] The rudimentary structures of the globe, which were found imbedded in the centre of the mass, were determined from the character of the groups of cells and fibre elements in their respective places, to be rudimentary portions of the eye which had assumed atypical development. He believes that the disturbance took place about the commencement of the second month of fœtal existence. Van Duyse[171 Jan., Feb.] (report of Landolt, corresponding editor, Paris) gives a phototype of a most interesting case of *cryptophthalmos* observed by Zehender and Manz. This is compared with one seen by the author. The 2 cases are similar to one another in the fact that the two children, with the exception of the defects and a trifling osseous malformation in the left parietal bone, mentioned below, presented no other abnormality. The father of Van Duyse's patient was comparatively old, and had married his niece. The patient was the fifth child of this marriage, and the first one was malformed. When seen the patient was 3 weeks old. There was total absence of the palpebral fissures, the lids, the cilia, and the lachrymal caruncles. Curious depressions and osseous malformations existed in the ocular and temporal regions, whilst other portions of the head were correctly developed. The orbital cavities appeared normal and the ocular globes seemed mobile. Quantitative perception of light existed. The author accepts Manz's theory of the formation of the condition.

A most careful study of 5 cases of *congenital hydro-ophthalmos* is given by Dürr and Schlegtendal.[204 June] Especially interesting are the previously but little recorded notings of the condition of the venæ vorticosæ and their surrounding tissues. In every case there was marked choroidal atrophy, disappearance of circular fibres, and great decrease in the meridional fibres of the ciliary muscle, with partial or complete obliteration of the canal of Schlemm. In the fourth and fifth cases there were decided vascular changes, consisting in the compression signs of ectasias. In several of the cases inflammatory signs and products were prominent. These expressions are considered as the result of dilatation of the tributaries at their supra-choroidal points of circumference. The course of the veins was very oblique, and their calibre quite narrow whilst they passed through the sclera. A very interesting condition in the fifth case was a localized thinning of the sclera, which, in connection with other changes, must be considered as the collapsed wall of a cavity, which most probably previously formed a bladder-like projection. Part of their own cases, as well as a number gathered from other sources, seem to demonstrate that the affection is the consequence of pre-existent inflammation, whilst on the other hand numerous instances appeared to express a primary congenital defect. In several cases the inflammatory changes were limited to the lenticular system; these they consider as due to traction upon the ciliary body by swinging motions of the lens in a distended capsule. In a second grouping, however, in which greater inflammatory symptoms were present, there was a normal lenticular apparatus. In favor of the congenital theory, 3 instances of pronounced dilatation and atrophy are recorded where inflammatory signs were but little marked. In 2 of them (4 and 5) the changes in the venæ vorticosæ were at total variance with those described by Birnbacker and Czermak. As to the pathogenesis, the majority of the cases speak in favor of the theory which presupposes stasis in the vessels of the choroid as a cause of intra-ocular pressure, whilst in the rest there is a chronic and recurrent inflammation located in different portions of the uveal tract, but especially implicating the recess between the iris and the lens, which furnishes material for re-absorption during the non-inflammatory intervals, and thus produces the hydro-ophthalmic condition with its well-known symptoms.

Michaelsen's[190 Apr.] case of *micro-ophthalmus*, with persistent pupillary membrane, coloboma of the optic nerve, and macular coloboma, is of intense interest. The patient was epileptic. Measurements of the external ocular appendages and the cornea are given. Most interesting, however, is the accurate description of the fundus. Two large irregular ectasias, one the disk itself and the other of the macular coloboma, are shown. The macular disturbance most probably shows the continuance of the retina over the colobomatous area. The visual field was normal, although there was a large absolute scotoma corresponding with the coloboma. According to the author, the case seems to furnish argument against Deutschmann's hypothesis (intra-uterine inflammation) in regard to the etiology, and rather indicates, in connection with the other defects, that all were the outcome of lack of development.

Two cases of *congenital deformity of the eyelid*, one of which showed complete absence, have been seen by Fuchs.[8 No. 14] He considers that it must have occurred after the second month of fœtal existence. Operative procedure will be attempted.

A case of *partial iridercæmia* has been seen by Franke.[353 Mar.] It is remarkable for the comparative position of the greatest defect, as can be seen by the sketches, and that, except a trifling corneal opacity in one eye, no other abnormality could be recognized.

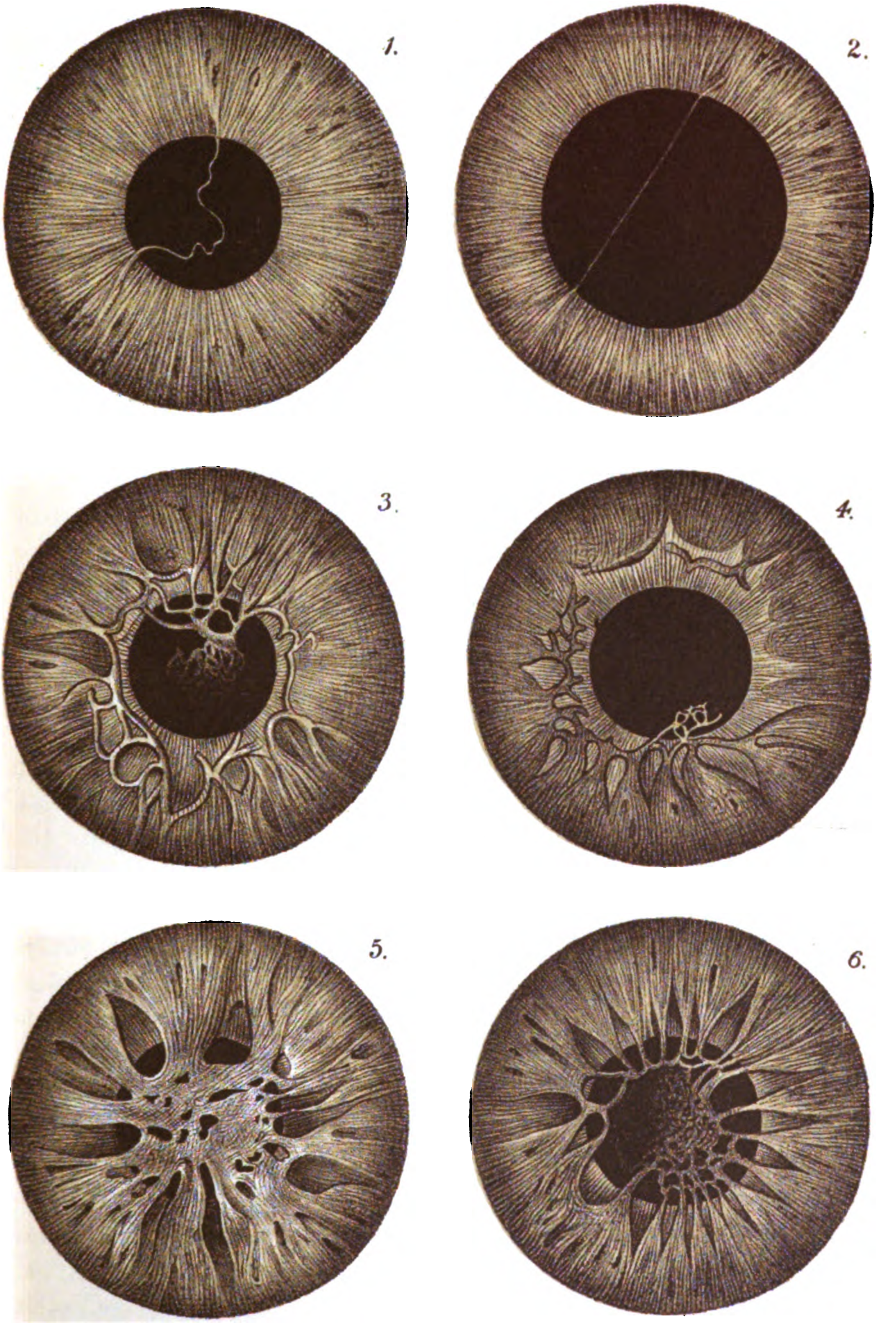


PARTIAL IRIDERÆMIA.
(Klinische Monatsblätter für Augenheilkunde.)

Nuel and Leplat[171 Mar., Apr.] reports a most curious case of *unilateral colobomata of the iris, choroid and optic nerves*, the peculiarity being that the clefts were situated to the temporal side. The condition is noted as occurring in the left eye.

Smith[81 Nov.] reports a case of *persistent pupillary membrane*, which consisted of four threads attached to the anterior surface of the iris at the greater circle and to a wedge-shaped opacity on the anterior surface of the lens-capsule. Two cases of persistent pupillary membrane are added to the list by Hasbrouck.[776 Jan.]

Rumschewitsch[254 Aug.] gives the results of his studies of the fœtal pupillary membrane, and compares them with the results of his anatomical investigations on the so-called pupillary membrane removed, with a piece of the iris, from a patient 21 years old. He claims that the final results prove the correctness of his opinion that the "membrana persistens" of adults is produced by an abnormal differentiation of the elements of the entoderm (really of the corresponding parts of the "head-plates"), and says that from these "plates" in the anterior section of the globe the following structures develop: the cornea (with exception of its epithelium), the iris and pupillary membrane, and the lenticular capsule. He asserts that, of all these parts, only the iris obtains pigment during normal differentiation; but yet, if this be abnormal, the pigment is not only found in the region of the pupillary membrane, but sometimes even on the anterior capsule of the lens itself. Wicherkiewicz $^{204}_{\text{Dec.,'88}}$ considers the mode of origin of persistent pupillary membrane as follows: Before the development of the iris the membrane is closely apposed to the anterior surface of the lens, as the anterior wall of the membrana capsulo-pupillaris, with which it forms a vascular sac, tightly surrounding the lenticular system everywhere. In the ocular development the growing iris lifts this wall from the lens, but allows the pupillary portion to remain in apposition with the latter. The author criticises the term "pupillary membrane" as erroneous, since it is not the pupillary position of the membrane alone which persists after birth; nor does he agree with the division made by Bock, who proposed the name "membrana capsulo-pupillaris." Wicherkiewicz calls the portion attached to the iris the iridal, whilst the part reflected over the lens he terms the pupillary portion. He next discusses the cause of the disappearance of the pupillary membrane and the mode of nutrition during its existence, finally summing the cases reported in literature. He thinks that the pupillary membrane is usually pigmentless, but says that it sometimes may contain pigment. Before giving the results of his own observation, the author describes three cases of Rumschewitsch, for the reason that he supposes them to be but little known on account of publication in the Polish language. In the accompanying plates, Figs. 1 and 2 illustrate a case before and after instillation of atropine, respectively; in Figs. 4, 5, and 6 the congenital anomaly was combined with ectopia lentis and eccentric pupils. It affected children of the same parents who are not related to each other. In Case 4 an iridectomy, with extraction of the lens in its capsule, was performed. He adds three other examples to the list. In Fig. 3 there can be seen a cribriform membrane over



Persistent Pupillary Membrane (Wicherkiewicz).
Von Gräfe's Archiv.

the iris, which is inserted into its ciliary margin. Firmly united to the peripheral portion of the iris, it assumes toward the pupillary margin the form of a thread, which floats freely in the anterior chamber. Several smaller ones curve back toward the capsule of the lens, on which can be seen a delicate deposit. The other eye of the patient presented a similar condition. In this case, dislaceratio membrana pupillaris was performed, producing marked increase in visual power. Fig. 5 shows a rare example of persistence of total pupillary membrane. Here there seems to be a perfect membrane over the iris, perforated at several points opposite the pupillary margin and pupil. At a point from the circulus iridis major on the membrane it is lifted from the iris and bulges anteriorly. Fig. 6 represents the left iris of the same patient. Here the membrane divides itself into three zones.

In a case of *monocular coloboma of the choroid*, in which there was a peculiar defect of the visual field, Weeks[1/Oct. 21] reports a similar condition of the field of vision of the non-colobomatous fellow-eye.

A case of *persistent hyaloid artery* similar to the one reported by Seely has been seen in a 15-year-old boy by Hasbrouck.[776/Jan.]

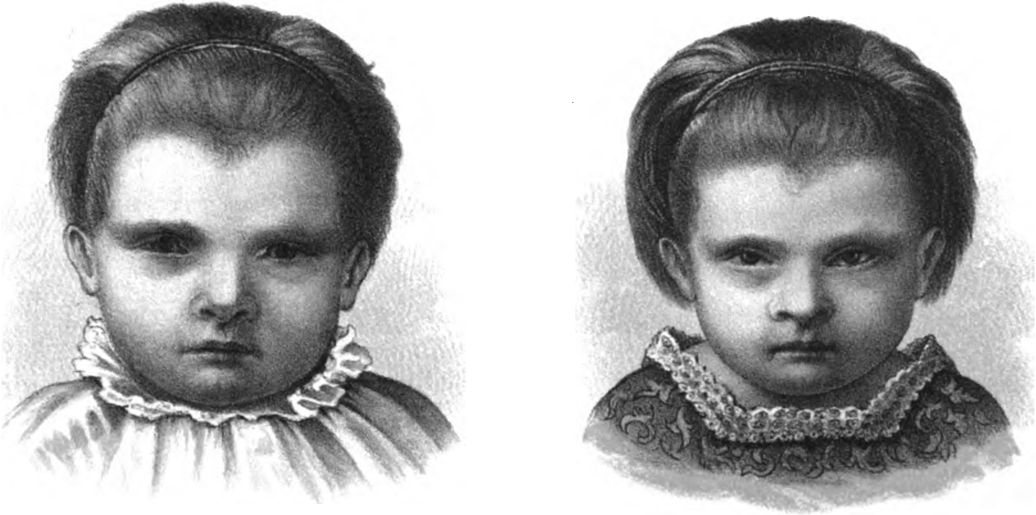
Jitoff (report of Maklakoff, corresponding editor in Moscow, Russia) reports a case of pecular distribution of one of the branches of the *central artery of the retina.*

Rumschewitsch[353/Feb.] weighs the evidence for and against the existence of *cilio-retinal vessels*, and comes to the conclusion that such communications exist. He gives a sketch of such an anastomosis in the superior nasal vein of the retina. Meighan[213/June] adds an instance of *opaque nerve-fibre* to the literature of the subject. The case presents the usual condition seen.

Blessig[353/Nov.] reports an interesting case of congenital *coloboma of the optic nerve* in unilateral micro-ophthalmus. The coloboma is limited to the optic nerve, leaving the uvea intact. The ophthalmoscopic picture is given in Fig. 2 of the accompanying plate. The region of the disk is occupied by a large funnel-like opening, with sharp borders everywhere except below, at which point the margin of the nerve is formed by a curved red seam. The temporal side of the disk is overhanging. The behavior of the retinal vessels, which curve abruptly around the disk margin and disappear into the depth of the funnel, indicates that the funnel is most probably of a goblet shape. The margin of the funnel is surrounded by a whitish ring of changing width (probably the scleral ring), this ring being bordered by a dark pigment zone which is broader to the nasal size of the nerve.

Rumschewitsch[190, May] reports an interesting example of a deep oval depression in the lower outer quadrant of the optic disk, through which, at its outer margin, the inferior nasal vein takes its exit. Beyond the disk, and almost to the primary bifurcation, the vessel is surrounded by a semi-transparent mantle. The second anomaly, shown in a 17-year-old girl, consisted in a curious condition of the nerve-head, which appeared as an elongated oval, to which, at the upper inner and lower border, three quadrangles, separated by pigment massings and appearing somewhat like retained nerve-sheaths, were attached. This area was connected by a long, narrow bridge, with a similar though smaller figure in the macular region. From the disk an artery and a vein pass superiorly and inferiorly, though, curiously, both of the lower branches have nothing but extremely fine twigs. Daraignez and Labougle[274, Mar., Apr.] have made a series of observations upon the external nasal nerve in reference to the operation of Badal. They affirm that the procedure is quite simple. Carpentier[73, Oct. 5] has made anatomical study of the four nerves that traverse the cavernous sinus, and which are intended for the orbital cavity. He gives an account of their relative positions at their points of entrance. Dor[78, Dec., '88] reports an interesting case of *congenital coloboma of both upper lids*, and gives the result of operation. The condition both before and after the operation can be seen by the accompanying plate. He believes that it is produced by a failure of union of the two halves of the first branchial arch with the frontal nucleus, this union beginning normally in the fourteenth or fifteenth day of fœtal life.

Hess[204, Apr.] gives a description of the anatomical structure of the *eyes of the European ground-mole and the proteus unguineus*. He finds that, contrary to common belief, the eye of the ground-mole is highly organized. Its peculiarities, however, are manifold. The eyeball is but 1 millimetre ($\frac{1}{25}$ inch) in the axis and $\frac{9}{10}$ of a millimetre ($\frac{1}{27}$ inch) in the equatorial diameter, the greater length in the antero-posterior diameter being due to the prominence of a cone-shaped cornea; this latter structure is found to contain a wide mesh-work of capillaries. The iris is well developed, and has very dark and thick pigmentary layers. The ciliary bodies and pro-



Coloboma of both Lids and appearance after operation (Dor)
Revue Generale d'Ophtalmologie.

Burk & Mc Fetridge, Lith. Phila.

cesses are also well formed. The retina is remarkable for the most excellent development of all of its layers, as well as to the abnormal thickness it holds in relation to the length of the axis of the eye (1 to 6 instead of 1 to 120, as in man). The visual cells are composed only of rods; there seem to be no cones. The central vessels are very large, and some branches penetrate into the vitreous body nearly to the capsule. The author is inclined to believe that the optic nerve-fibres are medullated. The great variance between his own and the views of others is found to be in regard to the structure of the crystalline lens. Hess finds it to be composed mainly of cells, with processes which are small anteriorly and at the centre, whilst they are larger near the posterior part of the anterior capsule. He believes that these conditions are favorable for perception of light. He next describes the eye of the proteus. His results differ decidedly from those of Leydig and Desfosses. The diameter of the eye is only fifteen to twenty times that of a red blood-corpuscle of the animal. This proportion, he thinks, explains the absence of blood-vessels in the eye, and consequently the absence of the choroid as a distinct layer. The retina has the same thickness as that of man, and fills nearly the whole sac constituting the eyeball. The lens, the iris, and vitreous are absent. The orbit proper is not present, the eye being surrounded by fibrous elements. There are no eye-muscles and no lids. The skin is continuous over the eye, and varies in thickness and transparency. He believes, accordingly, that the eye of the proteus anguineus has been arrested in the process of evolution, most probably at the stage of the "secondary eye-bladder," and hence remains functionless, beyond possibly perceiving light; this being in contra-distinction to the eye of the ground-mole, which, in spite of its minuteness, is well developed, and ready for the perception of surrounding objects.

Brand$^{254}_{\text{Dec.'88}}$ attributes the very contradictory evidence upon the question of the *mode of termination of the nerve-fibres of the cornea* to the ordinary methods of staining with the chloride of gold. He claims to have obtained the best results by simply hardening the globe in a 4- or 5- per-cent. solution of chromic acid. His investigations furnished the surprising results that the sub-epithelial and intra-epithelial net-work of nerve-fibres described by most writers do not exist, after all, but that the *rami perforantes* are the final branches, and carry the nerve-terminals. He also says that these perforating branches, although taking their course toward the epithelial covering, never touch the latter, but terminate in the corneal substance proper close to the anterior elastic membrane. He denies the termination of any fibre in corneal corpuscles, and asserts that the alternate branches of the division of the nerve-stems, which enter the periphery of the corneal substance at a greater depth, unite again with points of division of other ultimate ramifications, thus forming a net-work lying posterior to the *rami perforantes*, which take their origin from such points of ultimate division and run almost at right angles forward. All the nerve structures, including the nerve-terminals, which are similar in form to the Pacinian and tactile corpuscles and the bulbs of Krause, are ensheathed.

A most interesting account of the *development of the crystalline lens*, illustrated by a series of sketches, is given by Lennox.[157] In it he regards the early fœtal lens as the nucleus of a developed organ. He says: "When we consider that new layers of lens-fibres are being continually formed in this way, one theory of the origin of what is called Zonular cataract seems very plausible. This theory is that the nutrition of the lens becomes affected in some way during embryonic life, for a longer or shorter period, and, as a result, the lens-fibres which develop at this time do not become transparent, as they should. When the nutrition again becomes healthy, clear lens-fibres are again formed. This process may repeat itself, so that we may have several strata of opaque substance in such a cataractous lens. Such cataracts would naturally be congenital and stationary. Quite recently, however, Beselin, on the strength of a careful microscopical examination of a lamellar cataract, has upheld the view that the opaque areas in the lens are simple spaces between the lens-lamellæ, formed by the shrinking of the nucleus in consequence of a chemical change in its composition. These spaces are filled with granular detritus, and their formation may be accompanied by some granular degeneration of the lens-fibres themselves. Altogether, when one considers the changes by which the epithelial cells become fibres, one is struck by the analogy there is between them and those that occur in ordinary epidermis. In both we have to do simply with epiblastic tissue. In the epidermis the cells proliferate in the deeper layers, and are forced outward toward the surface, losing their nuclei and becoming flattened and horny, until at last they are brushed or rubbed off by some external medium. In the lens the cells proliferate in the anterior epithelial layer, are pressed outward, changed into flattened fibres at the equator, and then gradually forced toward the centre of the lens by the new fibres succeeding them, where they lose their nuclei and are pressed together in a sclerosed mass, which gradually becomes harder, denser, and less elastic with every year of life."

From the examination of 4-month-old embryos, newborn infants, and a 10-year-old child, Náumow,[21 No.3] arrives at the following conclusions: "1. The yellow spot exists in the 7-month fœtus. 2. In the 4-month fœtus the corresponding place is occupied by a retinal thickening, within which there is an early development of pigment. 3. That the differentiation of the layers of the retina proceed toward the periphery from the macula itself."

In an endeavor to study the *ocular lymph circulation*, Ulrich[254 Aug.] has made 15 experiments on rabbits, injecting staining fluids into the anterior and posterior chambers, and into the vitreous. The experiments are contradictory and do not lead to definite results. When the injection was made into the vitreous, the staining fluid was found in the optic disk, around the lens, on the posterior surface of the iris, in the so-called Fontana's space, and in the anterior chamber. In the case of injection into the posterior chamber, the results were staining matter in the anterior chamber up to Fontana's space, the perilenticular space, and the vitreous, whilst the root of the iris was traversed by a pigmented bridge. Injection into the anterior chamber showed infiltration of the ciliary bodies and the base of the iris. To examine the relation of the supposed forward and backward currents in the vitreous, the author injected the staining fluid in various eyes in different sections of the vitreous, but in every instance the staining matter was found both in the optic disk and Fontana's space as terminals. This fact, according to Ulrich, speaks against the hypothesis that for the posterior section of the vitreous the optic nerve is the only deferent channel. To try the behavior of the staining fluid during increased intra-ocular pressure, he tied the abdominal aorta in some cases and in others the venæ vorticosæ, with no positive results. In the latter cases, however, changes around the lens were produced which seemed to form a barrier to the forward movement of the stream. In regard to the method of transportation of the staining fluid from the posterior into the anterior chamber, the author holds that it very probably finds its way through the base of the iris.

Perlia[204, Apr.] describes a *newly-discovered nerve-tract* from the retina to a centre in the fourth ventricle, which he believes to be the root of the reflex movement of the ciliary muscles from retinal impressions. He has succeeded in tracing this bundle, which he calls "median opticus bundle," by producing secondary degeneration of one eyeball in the young chicken. He chose chickens and sparrows for his anatomical studies, upon account of the high development of their visual organs. To his description he adds most excellent magnified drawings taken from nature. The bundle separates from the optic tract toward the middle line and takes a separate course, running near to the dorsal surface of the respective crus, and in the roof of the aqueduct terminating finally in a nucleus near and somewhat lateral to that of the trochlear nerve. On the injured side this tract (treated by Weigert's method) stained much more deeply than the optic tract, and was completely effaced on the uninjured side. He confirmed these observations by repetition of his experiment on different birds. He was the first who succeeded in tracing a portion of the nerve elements of the optic tract beyond the ordinary starting-point in the middle portion of the brain to the roof or lateral part of the posterior section of the same. Relating to the function of the tract, he suggests its use for reflexes between the retina and iris, supporting this suggestion by the communication of Guddon of the existence of two sets of optic fibres, of which one only is to be considered as centripetal carrier of light impressions, while the coarser set he considers as centrifugal, carrying impulses to the ciliary muscles. The fact that in his specimen of a sparrow his median tract stained much more deeply than the other fibres, he argues in favor of this suggestion. He probably will submit the idea to further experimental proof.

Most interesting are the results of Bernheimer's investigations[254, June] upon the development and the course of the *nerve-fibres in the chiasma nervorum opticorum.* These studies were made upon embryonal human eyes by Weigert's method modified. The specimens were removed from Mueller's fluid into alcohol, and kept in the dark so as to insure against error, by taking care that no fibres should lose the reagent, and thus give negative staining results. He found that delicate swellings of the axis-cylinders appeared in the twenty-ninth or thirtieth week. In the thirty-third week these changes seem to have become more particularly pronounced in the lateral and posterior angles. Should the fœtus be vivified at this time, the medullation will be found greatly increased, though in every case the fibres of Meynert's commissure were the furthest developed. All the nerve-fibres were found medullated when the child was 2 weeks old. He also found that the inferior portion of the chiasm was composed of total-decussation fibres, whilst both direct and decussating fibres take their course through the upper half, thus showing the prevalence of the direct over the indirect tract.

PHYSIOLOGY.

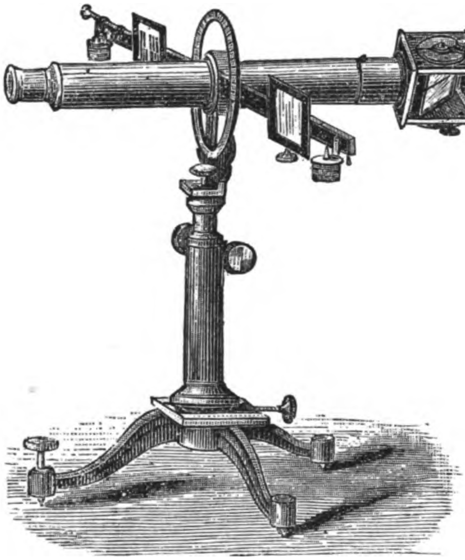
Rogier[208, July 6] concludes that large objects of the same heights, when seen upon different levels, appear differently sized upon account of the *difference in visual angle* for the two situations, the object gazed at vertically under a less angle seeming the smaller.

Another subjective *test for the detection of insufficiencies* of the ocular muscles has been introduced by Duane.[1, Aug. 3] This he terms the "parallax test." Whilst fixing an object at 20 feet, the patient is made to observe whether any movement of the image occurs when the eyes are alternately covered by a screen. If orthophoria exists, no movement should take place; on the contrary, heterophoria may be assumed if crossed diplopia is shown by the movement of the image to the opposite side, while homonymous diplopia is shown by the movement of the image to the same side. The degree of heterophoria may be measured by placing prisms before the eyes until the images no longer change their position with the movements of the screen.

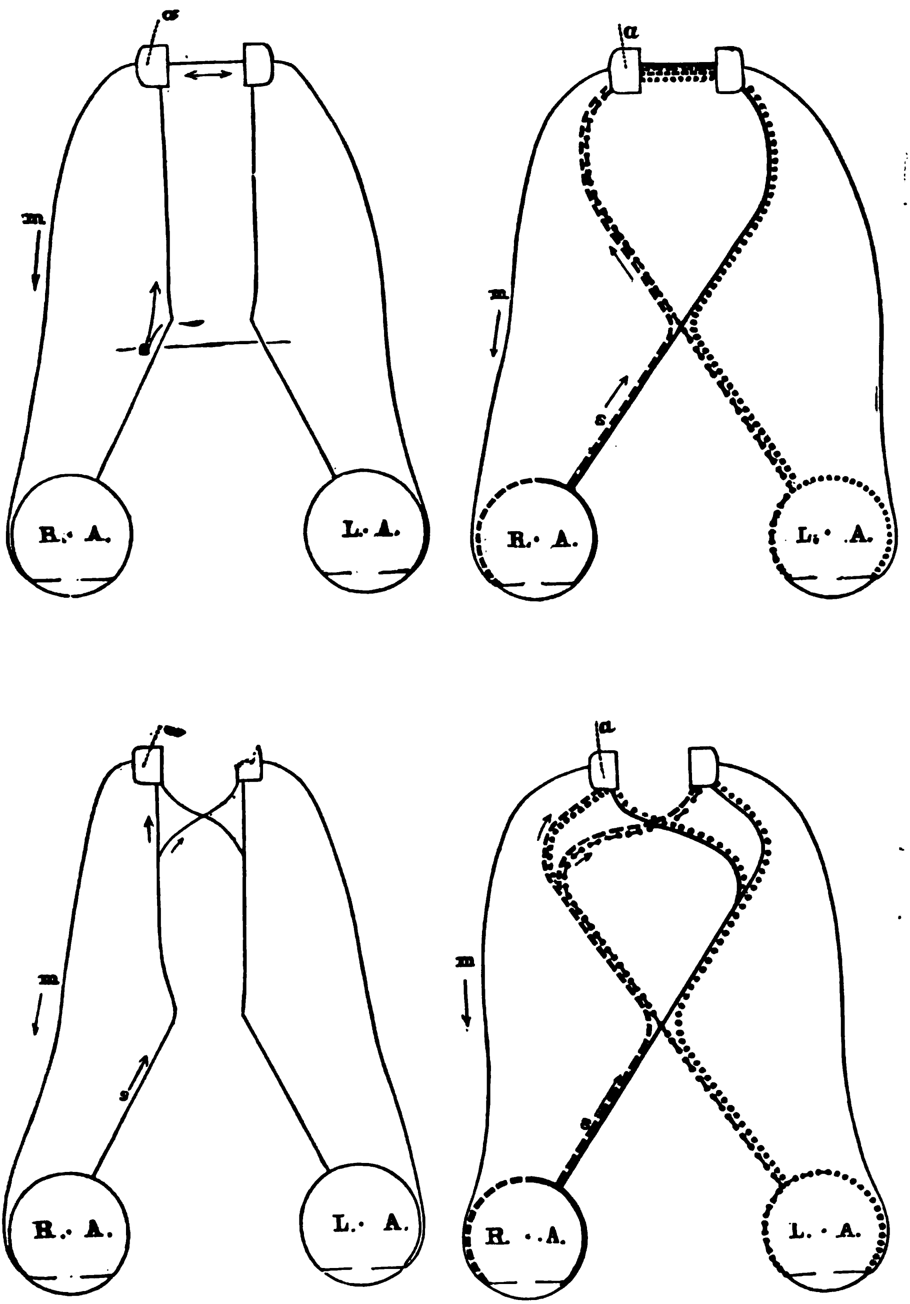
An *ophthalmo-dynamometer* has been devised by Alleman.[157, Aug.] In his instrument a point of fixation has been substituted for a flame. The advantage claimed by this is that the movement of the eyes during convergence can be watched, for, as he says, "it is frequently the case that we obtain quite as important information by observing the jerky, halting movements in convergence as by learning the total converging power."

Leroy[78, Mar.] has made some important modifications in the mirrors, lenses, and general mechanism of the *ophthalmometer* of Leroy and Dubois. A glance at the accompanying cut will show, by comparison with the instrument as shown in last year's ANNUAL, the advantages of the modified device.

Heddaeus[254, June] says that *pupillary reaction* divides itself into the examination of the motility of the irides, and into the study of the reflex sensibility of the eye with transmission of the impulse to the nucleus leading to reflex pupillary action to light. In the first, the question of isocoria and anisocoria, which is subdivided into absolute unilateral iridoplegia (absence of convergence and light reaction) and unilateral reflex iridoplegia (preservation of convergence reflex) and double iridoplegia, which he divides into absolute binocular, reflex unilateral, and reflex bilateral; to this he adds another subdivision where the failure is due to retinal lesion, pure and simple; this he calls "reflextaubheit." He further says that, if the lesion be unilateral, no pupillary changes will be present, as one eye is sufficient to receive the impulse of light and conduct it to both motor nuclei. He advances two theories for the unilateral type. He leaves the question open whether the anisocoria accompanying unilateral reflex iridoplegia may be due to disturbances in the course of the centripetal fibres. In the accompanying diagrams he represents two possibilities for this



LEROY AND DUBOIS OPHTHALMOMETER.
(*Revue Générale d'Ophtalmologie.*)



INVESTIGATION AND SIGNIFICANCE OF THE PUPILLARY SYMPTOMS.
(*Archiv für Augenheilkunde.*)

hypothesis. In Schemes 1 and 2 the line of junction between the two nuclei will have to be thought interrupted. In Schemes 3 and 4 (Moebius) the fibres connecting one motor nucleus with the pupillary (centripetal) fibres of both eyes or both tracts will have to be broken. (See ANNUAL of 1889, vol. iv, Section B.)

Fischer$^{353}_{\text{Dec.,'88}}$ finds, in a study of the historic cases of *congenital "total" cataract*, as described by Cheselden, Ware, Home, Franz, etc., that mostly, if not invariably, the child acquires color perception first, followed by direction of location, and, lastly, distance. He publishes a personal instance in a child of 8 years, who was under daily observation for three weeks.

Bellarminoff's$^{4}_{\text{Nos.50,52,'88}}$ suggestion for the *examination of the ocular fundus* by the use of a plane-glass, which is pressed against a cocainized cornea, although ingenious, is in no way new, having been suggested in Prevost's experiment of holding the eye of a living animal beneath the water, and Wharton Jones's later plan of pressure of a plane-glass against an eye which had been atropinized. In all of these experiments the convex surface of the cornea is flattened, permitting the rays of light to pass out from the subject's eye without any disturbing corneal reflex, which they would inevitably encounter were the cornea curved in its ordinary manner.

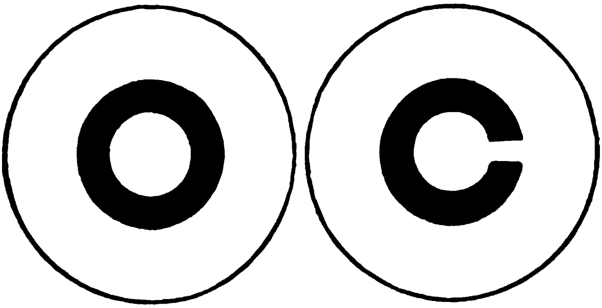
Under the title of "Intermittent Retinal Impressions," Bellarminoff,$^{725}_{\text{Jan.,Feb.}}$ according to Maklakoff, corresponding editor in Moscow, gives the results of his studies on the difference between the power of the centre and the periphery of the retina, as dependent upon color, intensity, size, and form of the object, and position of the retinal picture. After description of the instruments used and the methods of their importance, he arrives at the following conclusions: 1. The number of excitations requisite for generating a continuous impression for weak and moderate intensities of all colors is greater for the periphery than for the centre, as well as for the nasal portion of the retina, in comparison with the temporal. 2. This difference in the sensitiveness for intermittent impressions is most marked in the blue and violet part of the spectrum. 3. With high intensities, the number of the interruptions necessary for producing a continuous impression is greater in the centre than in the periphery, probably because the latter tires more easily. 4. If the size of the object greatly varies, the number of the intermissions necessary for the production of a continuous impression does not appear to change in the same manner. 5. The form of the object seems to be of no import. 6. The number of impressions necessary to produce a continuous impression increases with the decrease of the angular velocity of the rotation of the disk (presupposed that the number of sectors increase while the size remains unchanged). 7. The intensity of the positive after-images is greater and their duration shorter in the periphery than in the centre. 8. The perception in the mind of intermittent impressions as motions in the field of vision, occurring both in the periphery and the centre, rests in an inaccurate judgment, caused by distracted attention. 9. The greater sensitiveness of the periphery for intermittent impressions or differences in light generally is of great importance for the animal kingdom in the struggle for existence.

Under the title, "About the Perception of Light in the Periphery of the Retina," Treitel[204, Apr.] gives the result of a number of carefully conducted experiments. He seems to satisfactorily reconcile the various results obtained by different authorities on the above subject. The main points decided may be briefly given as follows: By daylight the retinal periphery (at about 30 to 40 degrees) is about ten times less sensitive to light impressions than the central portions, this being the more pronounced the farther the tested retinal point is situated from the fovea centralis; in reduced light the peripheral perception of light impressions, as compared with that of the centre, is much better than by daylight (only one-half), this difference being very probably dependent on the slow adaptation of the fovea centralis.

The conclusions of Tuke's interesting psychological study[47, Jan.] upon *subjective visual sensations* are given by the author: 1. Lateral pressure on the eyeball, or looking through a multiplying lens, never doubles an object unless it is actually external to the eye. Therefore, either of these tests of whether an alleged object is really external or only an hallucination is trustworthy. 2. The after-image of a luminous object, this being certainly on the retina, obscures or covers real objects, moves with the motion of the eye, and is projected when the observer looks on a dark ground. 3. If visual hallucinations present the same phenomena as those observed in these luminous after-images, they may be regarded as involving the retina. 4. If, on the contrary, these phenomena are not present, visual hallucinations do not involve the retina, being confined to the cortical centres, or possibly extending to the sensorium, and may occur when the optic nerves are atrophied. 5. The discovery of cortical sensory centres appears to throw light upon cases of hallucination not of peripheral origin, whether their abnormal action be regarded as primary or as secondary to that of higher cortical centres.

The adjoining cut shows Landolt's *simple test types.* They are to be used when vision is below $\frac{1}{10}$. As can be seen, they consist of an O and a C based upon the one minute angle of Snellen. The letters are graded to be seen at 50 metres (167 feet); thus, for instance, if the O can be differentiated from the C at 10 metres (35 feet) only, vision is equal to $\frac{10}{50}$, etc.

This year Barrett,[285 Jan.16] quotes almost verbatim Bickerton's most interesting and valuable accounts of the collisions between the steam-tug *Lumberton* and steam-ship *Isaac Bell*, as well as the well-known accident between the *Vanguard* and *Iron Duke*, which were given in last year's ANNUAL. He wisely thinks "that at the entrance examination of vision it is absolutely necessary to *test the color-sense* at the actual or proportionately reduced distances at which the examinee must distinguish colors when at business; that color-blindness may be developed in those who have passed such examination satisfactorily after the examinee has entered the service, as from excessive use of tobacco; and that diseases of the eye may develop after entrance into the service, even without the sufferer being conscious of their existence in the first instance."



SIMPLE OPTO-TYPES OF LANDOLT.
(*Archives d'Ophtalmologie.*)

Edridge-Green,[22 Apr.2] finds very grave theoretical and practical objections to Holmgren's *wool test* by asserting, first, that "an ignorant four-unit color-blind (that is, a person who is partially color-blind, but not color-blind to an extent necessitating his rejection) is more likely to fail than an educated two-unit (red-green color-blind);" second, that "a person with central scotoma will escape detection if examined by this test;" third, "the red end of the spectrum may be considerably shortened, so much so that a person may scarcely be able to distinguish red from black, thus making it obvious that this will not prevent him from matching a light-green wool with other green wools;" and, fourth, that "the test, being based on a fallacious theory instead of upon practical observations, repeats all the errors of this theory." He uses colored lights as the basis of his test, special kinds of neutral glass being used to change their intensity and character at will, these glasses having exactly the same effect upon the light as a mist or a fog.

Another stone—unfortunately plagiaristic this time—has been thrown at the foolish and far-famed color theories of Young-Helmholtz and Hering by Wuerdemann,[347, June] in a paper which he most properly terms "mainly a review . . . . and an attempt to record a few thoughts in support of what the writer believes to be the rational view of the subject." Although this may be so, it is a pity for true scientific cause and spirit that the article is guilty of constantly interpolating its compilation with unquoted thought and stolen sentences—in several instances, verbatim—from uncredited authorship. The author is, however, working for a good cause.

From a study of normal and defective color perception, Edridge-Green[2, Mar. 23] formulates the following "laws": "1. An individual can have no conception of the color which does not form one of the psycho-physical color-units, or a very apparent modification of one of them. 2. If the colors belonging to the two adjacent units be mixed an impression of both units is obtained, which is plainly perceived as a mixture. 3. If two colors not adjacent be mixed, the intermediate color will tend to be brought before the mind, or white will be the result in the case of pure light, gray where there is partial absorption. If any number of colors be mixed the resulting impression will be that of a unit, a modified unit, or white."

Barrett[285, Sept. 15] regards *muscæ*, in the main, subjective phenomena, with an objective basis of origin. In their initial production hyperæsthesia of the retinæ and errors of refraction, especially myopia, are the two noticeable factors. The author considers that they are very rarely, if ever, the forerunners of vitreous disease of sufficient moment to cause blindness.

DISEASES OF THE LIDS.

A *telangiectasis* in the left lower lid of a baby 4 months old was successfully removed by Alt.[347, Feb.] Two months later he was obliged to operate on a similar growth in the orbit.

A case of *xanthelasma palpebrarum* has been reported by Byers.[2, Feb.] It is of interest to note that the patient was markedly diabetic and suffering from hypertrophic elongation of the cervix uteri.

Seymour Taylor makes a subsequent report[1033, v.9] on a case of *pigmentation of the eyelid.*[1033, v.6] He found that the pigmentation was limited principally to the loose areolar tissue of the eyelid, although the deeper layer of the epidermis had a slight excess of normal pigment, which seemed to have attacked the white fibrous tissue of the part, not by staining the fibres themselves, but by insinuating itself between the histological elements, principally in islets and lumps, each lump appearing distinctly granular in texture, with a sharp, well-defined border. Chemical examination has led him to infer that the pigmentation was similar in all respects to bile-pigment, which had most probably become deposited during the patient's attack of jaundice nearly twenty years previously.

A case of *pediculus pubis* infesting the eyelashes in a 3½-year-old boy has been seen by de Schweinitz.[112, Mar.] Four additional cases of *phthiriasis palpebrarum*, all occurring in children, have been reported by Winfield,[245, Sept.] 2 of these cases being contributed by Sherwell. In one instance the pediculi infested both the cilia and the supra-cilia.

Noticing the obstinacy of certain varieties of *blepharitis*, the difference of action of therapeutical agents, and the peculiarities evidenced under the microscope, Fukala[190, Sept.] has been induced to distinguish between what he terms "blepharitis papillaris excorias" and "blepharitis glandularis." The former he considers dangerous to the integrity of the organ.

Calles[176 Oct.] has devised a plan for the treatment of *trichiasis and distichiasis* which are unassociated with entropion. It is accomplished by the use of an instrument which consists of two blades, one of which is solid, smooth, and well polished, and the other a hollow half-cylinder with its concave surface inward. When the lashes have grown sufficiently to allow of the operation, the round blade is heated and the hollow blade is introduced beneath the cilia, and the instrument is clasped for a moment's time; this procedure has the effect of turning the lashes upward and outward. The method is to be repeated every two weeks until the lashes assume permanently their normal position. The author claims that this method "will cure all those cases where the lashes turn directly downward and inward." Van Millingen[190 July] gives us the result of 100 cases of trichiasis operated upon by his so-termed "tarso-cheiloplastic operation." He thinks that they prove the efficiency of the method in producing permanent cure of the trichiasis and having a favorable influence upon secondary corneal processes. From one of his tables, it appears that the corneal sequelæ may promptly become better; also many of the superficial ulcers rapidly get well. According to his statement, the cosmetic effect is perfect. To prevent recurrence of corneal disease, he emphasizes care in the formation of the intra-marginal incision. He always takes care to include the inner rows of cilia in the flap. Should lachrymal disease or hypopion keratitis be present, he cures these processes before attempting the operative procedure.

In *entropion*, Schnabel[84 No.16] operates by the method of Snellen, except that he avoids the excision of the cartilage. He advises stitching the ciliary border to the cartilage. Thompson's modification of Hotz's operation for *ectropion*[196 May] consists in diverting the cilia outward without interfering with the position of the tarsal cartilage. The author accomplishes this by drawing a cutaneous flap tightly over the cartilage and sewing it to the upper free edge of the tarsus, thus permitting the flap to unite in its entire extent to the exterior surface of the cartilage. He limits the procedure to cases of moderate severity. By an ingenious application of three antiseptic threads, which are introduced into the lower conjunctival *cul-de-sac* in a horizontal manner, Gillet de Grandmont[173 Jan.] has been able to overcome the bad effects of senile entropion. He has allowed these sutures to remain imbedded for more than two months without injurious results. Noyes[347 Aug.] has operated for entropion by dividing the tarsus subcutaneously. This is accomplished by placing the finger under the upper lid and putting the tissues on the stretch. By then introducing a blunt-pointed knife from the middle of the edge of the lid flatwise beneath the skin to a distance above the superior margin of the tarsus, and turning the edge upon the finger, all the intervening tissues, including the conjunctiva, are divided. Wylie[74 Nov.] says that, in cases of trichiasis, where the extent of the entropion is not sufficient to warrant a Hotz operation, or when such an operation is contra-indicated by shortness of tissue from whatever cause, it is only necessary to split the free border of the lid longitudinally, just within the innermost cilia, to such an extent and depth as may be required, and insert a skin-graft, taken preferably from between the pinna and mastoid process. The author holds that the graft should be inserted while there is still rather free oozing of blood, as it will then be "cemented in position, and the surplus blood will fill all air-spaces and afford a medium which new vessels can traverse to nourish the graft." In operating for ectropion, Roche[22 May 20] simply dissects the conjuctiva off the tarsal cartilage and skin at the ciliary border, and applies a cooling dressing.

In cases of trichiasis, Knodine, as reported by Maklakoff (corresponding editor in Moscow, Russia), recommends transplantation of flaps of mucous membrane from the oral cavity into a deep incision made at the intermarginal edge of the lid. The author claims to have obtained good results. Valude (as reported by corresponding editor Landolt, of Paris), in speaking of the restoration of the eyelids and the disadvantages of the cutaneous graft, says, in conclusion,[274 July, Aug.] that cutaneous grafts, of whatever sort, can never constitute the method of choice in restoring eyelids, and are not to be classed among the autoplastic procedures of the eyelids; the employment of these should be restricted to certain special cases. Cicatricial ectropion cannot possibly be treated by a flap taken from the face. The Italian method of blepharoplasty, if it is practicable, should be resorted to; and, in case it is not, the cutaneous or dermo-epidermic graft should be employed. To obviate the loss of substance resulting from the ablation of a palpebral cancroid, the only difficulty is a choice of procedure. Facial blepharoplasty is always possible, but, if it be desired to spare the neighboring integuments to the least degree, it will be quite legitimate to take into account the good effect of cutaneous or dermo-epidermic grafts; this is especially true in regard to cancroid of the angles of the eye. The Italian method offers little advantage here. If the wound resulting from the removal of the cancroid has extended, and if a certain amount of natural reparation of the tissue can be depended upon, it would be advantageous to substitute secondary blepharoplasty for autoplasty or for the primary cutaneous grafts. To accomplish this there is a variety of choice. Following an operation for *symblepharon*, Pooley,[347 Apr.] has succeeded in preventing adhesion between the tarsal and bulbar conjunctivæ by the use of an artificial eye-shell, which was worn until cicatrization had taken place. From results obtained from 10 cases operated upon by transplantation of mucous membrane from the lip, Meighan[2 Mar.30] concludes that mucous membrane from the inside of the lip may be transplanted to the eyelids to replace conjunctival membrane, as it is a suitable substitute, does not irritate the cornea, and readily unites with the surrounding tissues. The operation is advised in cases where the symblepharon occupies one-third or more of the lid, especially where the sulcus is much involved, and where only little conjunctiva can be obtained. A case of restoration of the integument of the upper lid by transplanting a flap without a pedicle is reported by Weeks.[249 Mar.] From a perusal of reported cases, combined with a careful study of his own, the following conclusions seem warrantable: 1. The transplantation of a flap without a pedicle is not so likely to succeed as transplantation of a flap with a pedicle, and should only be employed when suitable tissue for a flap with a pedicle cannot be utilized. 2. Provision should be made for shrinkage to about one-fifth of the area of the flap marked out for removal. 3. The flap should be carefully dissected from the subcutaneous tissue, nothing below the rete mucosum or papillary layer being removed; it should be kept warm during the process. 4. All bleeding should be stopped before the transfer is made. 5. No sutures are required or desirable to secure the flap. 6. The bandage should be allowed to remain *in situ* from five to seven days before changing. 7. Thorough asepsis should be observed during the whole process.

Valude[274 May] recognizes two forms of *blepharospasm*, these being based upon a division of Giraud. He associates the first with ocular traumatism, and the second he relates to diseases of the nervous system. In Leszynsky's case [1, May 18] of bilateral blepharospasm with divergent strabismus, the interesting features were the cure of a blepharospasm by the correction of a myopic astigmatism existing in the left eye (the right eye being emmetropic) and the recovery of stereoscopic vision after division of left externus.

De Schweinitz [112, Mar.] reports an instance of *sudden graying of the eyelashes* in a healthy brunette of 18 years. The condition seemed to be limited to the right eye, and, like Hirschberg's case, presented the most discoloration in the middle third of the cilia of the upper lid. There appeared to be no assignable cause.

Based upon experimental studies, Santos Fernàndez, according to Chiralt, of Seville, Spain (corresponding editor), asserts that *chalazia* are of parasitic origin. Lagrange [274, May] has made microscopic study of 15 cases. He believes in the retention-cyst theory, the theory of irritative micrococci from epithelial *débris* in the glands, causing tarsal inflammation, and, lastly, in the theory of true cellular development independent of the Meibomian structures. The masses consist of young embryonic cells, with *débris* of epithelium and small quantities of fatty material, these congregations having a propensity for organization, as shown by new vessels in a couple of his cases. Micrococci were present. He believes that the process is one of glandular retention, chronic inflammation of neighboring tissues, and, lastly, ulceration. In some instances the mass becomes encysted, the parietes being alone formed by thickening of the surrounding inflammatory material.

A *horny growth*, 1 inch long (2.5 centimetres) and about $\frac{1}{8}$ inch (3 millimetres) thick at its base, has been removed from the lower lid by Theobald. [104, Aug. 17]

Alt [347, Feb.] has seen 2 cases of *congenital teratoma*, 1 occurring in a child 7 years of age and the other in a man 27 years of age. The growths were similarly situated in the intermarginal space of the left upper eyelid. Microscopic examination showed them to be composed of closely-packed connective tissue, with acinous glands intermingled with a large quantity of striated muscular fibre, hair, and fat.

Beard [139, June] has operated in 2 cases for the removal of *epithelioma* from the lower lid. In the first instance excision of the growth and the underlying fibres of the orbicularis was practiced.

In the second there was an additional transplantation of a flap of of the pedicle from the temple.

A most practical lesson is taught us in the study of a case of *palpebral sarcoma* reported by Van Duyse,$^{171}_{May}$ which was operated upon several times, but which eventually resulted in death.

DISEASES OF THE ORBIT.

Swan$^{6}_{July\,13}$ has removed a thorn ⅜ inch (9 millimetres) long from beneath the upper lid. The *foreign body* is supposed to have remained *in situ* for 2 years without giving rise to more than an obstinate attack of conjunctival inflammation, which rapidly subsided upon removal of the object. H. Wood$^{104}_{Aug.\,17}$ has removed a foreign body,—presumably a thin piece of hard rubber,—measuring ½ inch (12 millimetres) in length, from beneath the upper lid, in which position it had been lodged for 2 months without causing discomfort. A case of *foreign body in the orbit*, which remained *in situ* without detection for sixteen months, is reported by Marsh.$^{1}_{Aug.\,8}$ The mass was revealed by careful probing after the patient's assertion that something was growing between the lids on that side, unsuccessful search having been made at the time of the accident. The author properly gives a wise and useful suggestion to enlarge the conjunctival wound in such cases so as to employ Noyes' method of using the little finger as an explorer.

A case of *traumatic pulsating exophthalmus*, most probably caused by orbital aneurism, has been successfully treated by Hirschberg.$^{69}_{No.\,15}$ He employed compression of the corresponding external carotid and medication. A case of pulsating exophthalmus in a man 66 years of age, in whom the disease appeared when 1 year old, is reported by Bronner.$^{2}_{Dec.\,22,\,'88}$ It is remarkable that such a condition could exist for such a length of time without causing any pronounced injury to the organ. The author is of the opinion that it was caused by aneurismal varix between the internal carotid and the cavernous sinus. The patient had long become unconscious of the bruit.

Benson$^{2}_{Sept.\,28}$ reports a case of *traumatic aneurism* in the right orbit cured by digital compression. Interrupted pressure making no improvement, continuous compression was instituted. At the end of twenty-four hours the conjunctiva looked almost normal, an existing œdema disappeared, and a series of tortuous veins had become much reduced in size. One day later a disturbing vascular bruit could not be heard, whilst the eye had become normal in appearance.

Gifford[347 Sept.] has had optic-nerve atrophy from *hæmorrhage into the orbit*, with sudden death of the patient one month later, to follow extirpation of the lachrymal gland. There was also ptosis, motionless globe, pupil immobilly dilated, with absence of direct light reflex, intervascular hæmorrhage in the retina, small vessels and nerve completely white. He says that "the whole train of symptoms was evidently due to an infiltration of blood into the lid and orbital tissues, the pressure causing thrombosis of at least one of the retinal vessels, and interfering with the functions of the motor and optic nerves." He remarks, however, "the optic-nerve atrophy would of course have resulted from the thrombosis alone, but it might easily have resulted simply from the pressure," he having "seen several cases of atrophy from hæmorrhage into the orbit, without any sign of thrombosis." He believes, as far as he knows, that his case is the only one in which thrombosis with retinal hæmorrhage has been observed from bleeding into the orbit.

Corresponding editor Maklakoff informs us that Sapeschko has seen 6 cases of *exophthalmus*, having their origin, he believes, in dilatation of the frontal sinus. There was marked displacement down and to the outside, with ectropion of the upper lid. A free incision into the orbit gave pus, but, as the symptoms increased, he introduced a canula into the cavity for drainage, which caused exudation of purulent material in jets, which were synchronous with the heart's action. Supposing a communication to exist between the frontal sinus and the intra-cranial cavity, he trephined the skull in the region of the sinus, associating this operation with a permanent communication between the cavity and the nasal labyrinth. The trouble soon disappeared. Three similar cases are described in full.

A case of *traumatic enophthalmos*, with retention of perfect acuity of vision, most probably resulting from a fracture and depression of a portion of the orbital wall, occurring in a 13-year-old lad, reported by Lang,[1033 v.9] is of interest on account of its rarity. In a case of right-sided enophthalmus changing to exophthalmus by bending the head forward, seen by Gessen,[190 June] the author assumes a local disease of the retrobulbar veins leading to a weakening of their coats, with a varicose condition.

Sixteen cases of *orbital growths*, including cystic tumors, ivory exostosis, hypertrophy of the lachrymal gland, distention of the frontal sinuses, abscess in the ethmoidal sinus, and a most interesting case of retro-ocular abscesses communicating with one another through the base of the skull, have been described in detail by Jeaffreson.[6 July 20] The thirteenth case, which was one of exophthalmus in both eyes, is of intense interest. The patient, a girl of 13 years, became suddenly attacked with marked cerebral symptoms, followed by proptosis, associated with semi-dilated pupils, inactive irides, and double optic neuritis, the child being semi-conscious and answering in monosyllables when aroused. Deep incisions into the orbits showed pus which was in connection with both orbital cavities. Twenty-four hours later the patient became conscious and vision returned. At the end of ten months there was complete restoration to health and no trace of optic neuritis. A case of fibroid tumor of the orbit in a woman 75 years of age is reported by Reid.[213 Mar.] Palpation revealed a firm, freely mobile, lobulated growth about the size of a walnut, which extended deeply into the orbital cavity in the situation of the lachrymal gland. There was no displacement of the eyeball nor double vision. The tumor, which was in a well-defined, highly-vascular capsule, was readily extirpated. Exploration of the cavity failed to detect the lachrymal gland or any further continuation of the tumor mass. On examination, after the wound had thoroughly healed, a small, hard, irregularly-nodulated mass could be felt deep in the orbit opposite the site of the tumor, and which seemed to be firmly adherent to the periosteum of the roof of the orbit. The author suggests that, "if the growth had its origin from the periosteum, as most fibromas of the orbit do, the removed portion must have been most probably detached from the remaining nodule." Reid[2 May 11] gives the notes of 3 additional cases of orbital tumors, in all of which removal of the growth was successfully accomplished. Buckner[61 Feb. 28] has had an exceptional opportunity of witnessing a recurrence of a fatty cyst of the orbit after nine years' remission, the primary attack occurring when the patient was 10 years of age. Examination of the wall of the cyst, at the first operation, showed that it appeared to be a continuation of the external sheath of the optic nerve. The contents of the cyst consisted chiefly of fat and epithelial scales. At the time of the relapse the tumor apparently enveloped the ball for half its circumference, and adhered closely to the adipose tissue, deep in the orbit. Rushmore[40, July] describes an interesting case of cyst of the orbit which was removed by operation, revealing a sac which contained nothing but a few drops of blood-serum. Alleman[157, Jan.] reports a case of dermoid cyst which closely simulated osteoma by pushing the lachrymal gland in front of the growth. A case which is said to have been successfully treated by inunctions of iodide-of-lead ointment, is reported by W. J. O. Harle.[6, Feb.]

An exceptional case of *suppurating hydatid cyst of the apex of the orbit*, causing proptosis, ptosis, and limitation of the action of all the extra-ocular muscles except the external rectus, has been seen by Rockliffe.[2, Dec. 22, '88] Recurrent attacks of inflammation during five years gradually produced blindness. A cavernous tumor of the orbital cavity, which was so situated as not to produce any symptoms of pressure upon the globe, such as exophthalmus, diplopia, decrease of visual power, etc., has been removed by Ahrens.[353, Nov.] Emrys-Jones[1033, v. 9] adds another case of cavernous angioma to the list of this unusual affection. His case occurred in a female of 18 years, and had been known to be in existence for nine years. Microscopic examination showed the entire mass to be composed of an open, sponge-like frame-work of fibrous tissue, with numerous round, sinuous, and irregular cavities filled with blood-corpuscles. No separable capsule existed, but a condensation of the fibrous net-work took place at the surface of the growth in its entire extent. No recurrence has ensued.

Weeks' case[249, Mar.] of *echinococcus in the orbit* is said to be the first reported in this country. The patient was an Austrian Jew who had lived in the United States for five years. Examination showed a swelling of the right upper lid, injection of the conjunctiva, with the presence of muco-pus. The movements of the globe were restricted in all directions. Tension of the ball was plus two. Palpation over the upper lid revealed a firm, elastic, slightly-movable tumor, situated in the orbit to the inner side, moving with every motion given to the globe. Aside from a slight rarefaction of the choroid, there was no pathological change in the interior of either eye. An incision into the tumor was followed by the escape of clear fluid, pus, and seven daughter-cysts, which ranged in size from 17 by 9 millimetres ($\frac{2}{3}$ by $\frac{1}{3}$ inch) down to 2 by 1 millimetres ($\frac{1}{12}$ by $\frac{1}{25}$ inch). A small, yellowish mass projected into each cyst, which probably represented the head of the entozoon. Of this, however, the author is not certain, as he failed to determine the existence of any suckers upon them. The entire diagnosis seems to be based upon the appearance of three hooks discovered in a daughter-cyst. A most thorough and careful review of 31 similar cases is given.

A case of *carcinoma of the orbit* in a man 76 years old is reported by Reid and Harrison.[218 Mar.] The growth extended upward in front of the ball, pushing the globe up back of the upper lid. It was firmly wedged in the cavity of the orbit, and extended as far back as the optic foramen. The tissues of the upper lid were involved, and the tumor had become firmly adherent to the sclerotic. The microscope showed that the growth was fibro-cellular, presenting a fine connective-tissue appearance at places associated with strong interlacing fibres, the whole mass being covered by a thick layer of effete epithelial cells, which penetrated to the growth at many points. Barrenechea[190 Apr.] adds an additional case of *fibro-sarcoma*, probably taking its origin in Tenon's capsule. The sclera seemed free from neoplastic formation. Ayres,[53 Feb.2] gives the notes of 3 cases of sarcoma, one of which resulted in death. In the same article he makes mention of a 4-year-old child with a gliosarcoma in the same region. Reid[213 Mar.] has removed a non-encapsulated melanotic sarcoma from the orbit of a 72-year-old man. The tumor, which seemed to be of cranial origin, completely filled the cavity of the orbit and penetrated the sinuses at the apex. The exposed bones of the cavity and the sinuses were thorougly scraped with a spoon. "The conjunctival surface of the tumor was covered by a dense fibrous layer, the opacity of which completely masked the nature of the growth during life." Beneath this membrane the microscope revealed a densely-packed cellular layer of epithelial-like character, containing well-defined cells, large nuclei and nucleoli, with an occasional pigmented cell having a clear nucleus. Deeper in, the growth consisted of large pigmented cells. Two cases of orbital sarcoma in children are reported by Alt.[247 Feb.] The first, which was most interesting on account of its family history, occurred in a male child, $1\frac{1}{2}$ years old, whose mother had a growth in the axilla, which proved to be a small spindle-cell sarcoma. The patient's grandmother had died of cancer, and an aunt was under treatment for cancer of the uterus. The orbital tumor was removed, and was found to be a small, round-cell sarcoma. In the second case the neoplasm was removed from the left orbit of a boy 2 years of age. The growth was found to be a round-cell sarcoma with portion of a myxomatous character. Six weeks after the operation, a new growth filled the entire orbit and protruded to some extent between the lids. A case of melanotic sarcoma of the right orbit in a girl 6 years of age has been seen by Wiesner.[101 Apr.] At the time of the first examination there was exophthalmus. A small, semi-fluctuating, conical mass, situated at the inner canthus, could also be traced a short distance into the orbit. One month later the exophthalmus had greatly increased, the conjunctiva became inflamed, and the cornea ulcerated and sloughed. After enucleation, a red, spongy mass not connected with or adherent to the bone filled the remaining cavity of the orbit, the optic nerve and eyeball being found free from disease. The sarcomatous mass was entirely removed, as well as a portion of the lid which had been attacked. In three months' time the tumor had re-appeared and grown to the size of a "hen's egg." The orbital cavity was again cleaned by scissors and thermo-cautery. The child died about ten months after the appearance of the disease.

Jamain[171 Jan.] gives the interesting details of a case of bilateral and symmetrical *orbital exostoses*, which were successfully extirpated without injuring the eyes and without harming vision. He advises radical treatment, and prefers extirpation of the growth to resection, which is best accomplished by the use of the lever and forceps. A case of osteoma of the orbit, causing proptosis and displacement of the eyeball downward and to the outer side, is reported by Lee.[187 July] The movements of the globe were good except a slight limiting of the upward excursion. Upon digital examination, the left orbit was found shallower than the right, as though its cavity was encroached upon by a lowering of the roof, and the general surface of the thickened bone was smooth with the exception of one or two points, where somewhat uneven, rounded elevations were discovered. Ophthalmoscopic examination showed a slight degree of neuritis. Frontal headache was the most prominent subjective symptom.

In the treatment of *caries and necrosis of the orbit*, Knapp[9, Aug. 8] advises that foci of suppuration should be freely opened, the cavity thoroughly cleansed, and drainage established, which can be well done by means of small silver tubes provided with flanges. He advises the scraping away of rough bone with a sharp spoon, and removes necrosed portions of bone as they become loose, or when they can be detached without injury to the adjacent tissues. He says that in every case the condition of the neighboring cavities, especially the nose, should be carefully investigated.

In the 4 cases of *orbital cellulitis* and *orbital abscess* reported by Lawford[6, Aug. 10] the most noticeable feature was the apparent absence of adequate cause for the cellulitis. The interesting factors of the fourth case were the extension of inflammation to the opposite orbit and the presence of albuminuria, which disappeared concomitantly with improvement in the local and general symptoms; these, in the author's opinion, contributing support to the hypothesis that the condition was in some way connected with the inflammatory process. As an example of quite a number of cases of abscess of the ethmoid cells, frontal sinus, and orbit operated upon by C. S. Bull,[1034] he gives an instance of a case where free incisions, with irrigations, twice daily, through a rubber drainage-tube, produced good healing granulation tissue along the external wound at the end of three months, and requiring close observation in another month's time to discover that an operation had been performed, is both interesting and valuable, as showing such good recovery without any bad results in a comparatively short time. Wilson[234, Jan.] reports a case of orbital cellulitis which resulted fatally. The point of interest in this case is its insidious onset, followed by symptoms of acute character, and of sufficient intensity to destroy not only the eye but the patient in twelve hours' time.

C. S. Bull[1084] gives a most interesting and careful clinical history of a case of *tumor of the maxillary antrum*, *nasal fossæ*, *ethmoid cells*, *orbit*, *and cranial cavity*, which resulted in death after an operation for removal of portions of the mass, which was intended merely to afford the patient some relief from the intense pain that had become so severe that he had to be kept under the influence of opiates. In conclusion, the author says: "In all probability, the disease started in the maxillary antrum, possibly as the result of long-continued irritation and inflammation, extending from the chronic naso-pharyngitis, and thence growing in every direction inward to the middle and superior nasal meatus, and thence into the cavity of the ethmoid bone, and upward through the orbital plate of the maxillary bone into the orbit. The absorption of a part of the roof of the orbit and the extension of the growth into the anterior fossa of the skull was probably the latest stage of the disease."

DISEASES OF THE LACHRYMAL APPARATUS.

Cousins[2, Mar. 23] has removed *a piece of fine glass* with a forked stem, over 1½ inches (37 millimetres long), from the lachrymal duct of a boy. Weiss[353, Jan.] recommends treating the *lachrymal blennorrhœas* of the newborn by the introduction of a probe which is made equal to the thickness of a No. 3 or 4 Bowman, and which gradually tapers to a No. 1 Bowman. He considers the method prompt, effective, and perfectly safe. Truc[274, July] has determined that extirpation of the orbital portion of the lachrymal gland has proved of great advantage in *persistent watering of the eye*, having found that the epiphora immediately stops and the conjunctivitis rapidly ameliorates. He believes that the operation is especially indicated when there is an old granular condition with lachrymal obstruction. Two cases of *adenoma of the lachrymal gland*—one occurring in a female 28 years of age, the other in a child of 8 months—have been successfully removed by Snell.[2, May 11] Microscopic examination of the growths in both instances showed acini lined with epithelium. After first obtaining local anæsthesia by cocaine, Gorecki[274, Sept.] effects *electrolysis of the lachrymal duct* by passing an ordinary Bowman's probe into position, and then connecting the negative electrode of a battery with the handle of the probe by a *serre-fine*, and effecting continuity of circuit by forcing a small platinum tracheotomy cannula, to which the positive electrode of the battery has been fastened into the corresponding nostril so as to meet the probe. After this has been done, a larger-sized probe can be readily introduced. In those very rare cases of the *epiphora* in which there is sufficient nervous shock produced by mechanical dilatation to warrant discontinuance of the method, Solomon[6, Feb. 23] recommends excision of the lachrymal gland. Eugene Smith[202, Jan. 5] gives a number of practical suggestions in the treatment of lachrymal affections, calls attention to the similarity between *erysipelas and abscess* of the lachrymal sac, and adds that he has seen not a few cases of dacryocystitis diagnosed and treated as facial erysipelas. Adler[8 No. 11] claims to have seen the gradual disappearance of a round-celled *sarcomatous growth of the lachrymal gland* in a 70-year-old man by the administration of Fowler's solution. C. S. Bull[1034] has removed an *adeno-sarcoma of the lachrymal gland* occurring in a man of 35 years. Although the patient had been seen at regular intervals for nearly two years, no recurrence had taken place.

DISEASES OF THE EXTRA-OCULAR MUSCLES.

In a paper on the etiology of *strabismus*, Fergus[213 Apr.] accepts Donder's theory of causation for cases occurring in hypermetropia, but believes Schweigger's to be the correct one in those instances which occur in myopia and emmetropia. From an analysis of 215 cases (20 of emmetropia, 71 of myopic refraction, and 110 of hypermetropic refraction, 7 with mixed astigmatism, and 7 with anisometropia, as shown by Stevens's phorometer) Marlow[76 Dec.] decides adversely as to the correctness of Stilling's theory of the position of rest as a cause of strabismus. In reference to the etiology of ametropic concomitant strabismus (Landolt, corresponding editor in Paris), Abadie rejects stereoscopic exercises in the treatment, as the final result may be immediately obtained by operation, basing this belief upon the fact that it is impossible to obtain perfect binocular vision in such cases. To this latter assertion Landolt replies that binocular vision is possible, even without the same degree of visual acuity upon the two sides. Motais speaks of the value of the orthoptic method, whilst Dianouse considers strabismus with amblyopia as hereditary in its etiology. DeWecker operates upon the permanent variety, and proposes capsular advancement. Nuel assumes that the hypertrophic condition of the muscles is consecutive to the production of the squint. Stevens[9 Aug. 3] holds that the method of measuring the deviation by the prism, which is required to bring the produced double images into line, is superior to all other ways of estimating the amount of squint, and says that by careful trials diplopia can be secured in almost every case. Where the degree of squint is very high he advises partial correction by one or more partial tenotomies or advancements, followed by an accurate determination of the remaining deviation, and says that the result to be obtained is not simply cosmetic, with an apparent straightening of the eyes, but consists in the restoration of normal binocular vision. He thinks that the deviation is purely lateral in but a few cases.

In a case of divergent strabismus in which there was a failure of correction after several operations, including advancement of the internal rectus by Tweedy's method, Maire[234 July] obtained partial parallelism of the eyes by advancing the internal rectus and Tenon's capsule, and fastening them by a scleral stitch close to the inner border of the cornea, the capsule being further attached by a conjunctival suture. Complete parallelism was obtained by subjecting the opposing external rectus to a tenotomy. The author considers that a firm attachment or anchorage for the advanced muscle is of great importance. Beard[347 Mar.,Ap.] practices advancement by means of a single suture. The advantage claimed for the operation is the inevitable advancement of the muscle, both in the direct line of its axis and that of its natural action. In tendon resection and tendon contraction for shortening the recti muscles, Stevens[1 Mar.30] gives a careful analysis of the operative procedure, with cuts of the instruments employed. From an analysis of the operative correction of vertical-deviation origin, and in particular by muscular advancement, Eperon[274 May] draws the following practical conclusions: 1. Vertical deviations of the eye of paralytic origin are generally very slight (of 0° to 10° in the primary position), and in consequence are easy of cure by operative interference after failure of other treatment. 2. The success of operations is favored by the fact that the elevation and lowering of the eye are affected by two different muscles, one of which usually continues its action. 3. From a surgical and practical stand-point, although not strictly physiological, we may consider that the superior rectus and inferior oblique are associated for elevation, the inferior rectus and superior oblique for depression, whilst the superior rectus and superior oblique and the inferior rectus and inferior oblique are mutually antagonistic. 4. The effects of paralysis of superior oblique can be perfectly corrected by advancement of the inferior rectus of the same eye, or by advancement of the superior rectus of the healthy eye; the first method is the preferable. 5. The effects of paralysis of the inferior oblique are equally susceptible to correction by advancement of the superior rectus of the affected eye; it can also be very favorably modified by tenotomy of the inferior rectus of the same eye. 6. Compensatory tenotomy of the associated straight muscles of the healthy eye, which was first proposed by Graefe, and again by Alfred Graefe, is uncertain in its results. In all cases it should be avoided with the inferior rectus, as operative insufficiency would appear, which would give rise to asthenopia during work at short distances, especially when this muscle is brought into prolonged action during continued lowering of the eye. Nevertheless, this operation may be an excellent auxiliary in advancement of the inferior rectus of the affected eye, or of the superior rectus of the healthy eye, in those cases of very pronounced paralysis of the superior oblique. 7. After some practice with advancement the effect of this operation is easier to regulate, and is more certain of result than tenotomy. By greater or less advancement of the muscle, as well as by difference of time in the removal of the confining sutures, the effect may be varied from 0° to 10° or more in the primary position, although, when the effect is exaggerated, it is not always prudent to remove the threads before the third day. Operative insufficiency is less liable to follow advancement than tenotomy. 8. In slight deviations capsular advancements may advantageously replace muscular advancements. 9. Advancement is the better to employ in cases of paralyses of the superior and inferior recti, though more especially the latter; in this latter case tenotomy of the oblique, according to the method of Landolt, may be combined, if necessary. 10. The operations enumerated do not seem to show any bad effect, which we might expect to see associated with an inflammation of the retinal meridian. Experience shows that in combating the effect of want of action of these muscles and in facilitating the re-establishment of binocular vision the impulse which is sufficient to produce functional harmony is obtained. 11. Experience shows that the favorable effect in these operations is not limited to the portion of field of fixation near the point of primary fixation, but that the effect is made good throughout the whole normal binocular field of fixation. 12. When a vertical paralytic deviation is complicated by a horizontal deviation of the same origin the final success depends upon the possibility of the cure of the latter. Moreover, in most all of these cases, the estimation of the monocular field of fixation furnishes an important element in the prognosis.

Gardner$^{9}_{\text{Aug. 3}}$ has obtained complete success in a considerable number of instances of convergent strabismus, with marked improvement in many other cases of the same kind, by careful correction of the existing ametropia and continuous wearing of the correcting glasses, without resort to other measures. He regards orthoptic exercise of considerable value, and believes that such a measure should always be tried before resorting to operative interference with the eye-muscles. Based upon very numerous observations carefully taken by Landolt (corresponding editor in Paris), Vialet, his assistant, has demonstrated that an eye with a carefully-performed strabismus operation gains considerable visual acuity by stereoscopic exercises.

McKay$^{760}_{\text{Nov. 2, 9}}$ gives notes of 21 cases of *insufficiencies* which were successfully treated, either by prisms or by graduated tenotomies; he making it a rule to correct all that may be possible by weak prisms, and "to operate by graduated tenotomies upon those whose insufficiencies are too great for prisms."

From his experience with operative interference in *heterophoria*, Lewis$^{776}_{\text{July}}$ concludes "(1) that in suitable cases, especially those in which all usual methods have failed, tenotomy may be followed by very brilliant and gratifying results; (2) that the chief value of this method of treatment is in hyperphoria, and, this having been corrected, disturbance of balance in the lateral muscles may disappear spontaneously; (3) that while in chosen cases the results are not always satisfactory, nevertheless a large number of cures in otherwise hopeless cases renders tenotomy a most valuable resource in certain forms of asthenopia and in general neuroses dependent upon heterophoria." Standish$^{99}_{\text{Sept. 12}}$ has performed the operation of partial tenotomy for the relief of headache and inability to use the eyes in 5 cases of neurasthenia, associated with insufficiencies of the ocular muscles. In all but 1 there was prompt relief of the local and general symptoms. The author is of the opinion that the instances requiring operative interference are not numerous; that the vast majority of cases of neurasthenia and headache which have the eye for a starting-point of the condition being completely relieved by proper correcting glasses, and this, too, when an insufficiency, according to the von Graefe test, exists. In the treatment of heterophoria, Deady$^{776}_{\text{July}}$ favors, in the majority of cases, exercise of the faulty muscles with prisms, rather than the performance of tenotomy. He properly concludes his article with the assertion that "it is, of course, understood that anomalies of refraction, of whatever variety, are to be corrected by the proper glass before undertaking their results by this or any other method."

From the results obtained by the use of tenotomies, C. F. Sterling[776 Jan.] is of the opinion that the procedure affords relief in certain obstinate and puzzling cases of *asthenopia*, but at the same time advises against a too hasty resort to the method when the combination of a very low prism with refractive correction will accomplish all that could be done by an operation.

In a short article on the *anomalies of the ocular muscles*, in which graduated tenotomy is enthusiastically lauded, French[776 July] gives an illustrative case, which he says was cured by tenotomy, muscle exercise, and correction of refraction error.

Campbell[776 July] is of the opinion that most cases of heterophoria are associated with anomalies of refraction, which are the primary cause of the muscular asthenopia, and consequently that, if heterophoria be corrected by operation, the final result will be unsuccessful if the optical error causing the same is not corrected also.

In those cases of insufficiencies affecting the lateral muscles where surgical interference is either impossible or contra-indicated, where the use of correcting lenses and prisms has not been sufficient, and where the retina is quiet and dread of light is absent, de Schweinitz[9 Nov. 3] finds that ascending doses of a good tincture of nux vomica, if pushed to its full physiological effect, will afford in most cases marked relief. Noting the experiments of Musser, he found that between the ages of 15 and 40 a dose of 45 drops will readily be borne, and, in fact, much larger doses, if watched, may be administered without hesitation.

A curious *serous or mucous cyst*, situated on the outer face of the right internus, is reported by Nuel and Leplat.[171 Mar.] It appeared as a swelling about $\frac{3}{4}$ centimetre ($\frac{1}{3}$ inch) in length to the inner side of the cornea. Upon opening, it was found to be a clear vesicle filled with transparent fluid.

A case of total monocular external and internal *ophthalmoplegia*, said to have resulted from traumatism, has been seen by Hubbell.[170 Sept.] Ophthalmic examination showed partial optic-nerve atrophy. Vision was absolutely negative. The author thinks that it was probable that there was direct injury of the nerves whose functions had been annihilated. An additional case of monocular ophthalmoplegia with proptosis is reported by C. M. Thompson.[206 May] Examination showed diminished sensation over the area of distribution of the frontal nerve, anæsthesia of the conjunctiva, and total immobility of the eyeball. The pupil was fixedly dilated at 5 millimetres ($\frac{1}{5}$ inch). The ophthalmoscope revealed slight congestion of the inner half of the optic disk, with some turgescence of the veins. Under seven weeks' treatment with increasing doses of potassium iodide, vision improved and the movements of the globe became "fairly free." The case is of interest on account of the short duration and completeness of the paralysis and of the difficulty in determining the cause. The author is of the opinion that the history of the case "pointed to the existence of a tumor situated in the posterior orbital region."

DISEASES OF THE CONJUNCTIVA.

The notes of a case in which the accidental introduction of cheese-ptomaines into the eye was followed by *œdema and congestion* of the conjunctiva are reported by Ratton.[2 Feb.2] This attack, like a similar one occurring in the same patient three weeks previously, subsided in the course of an hour.

H. D. Noyes[347 Aug.] gives an instance of *inflammation of the bulbar conjunctiva* produced by an eyelash, which had entered the lower canaliculis and projected from the lower punctum.

Meighan[213 Jan.] has seen a case of *argyria* of the conjunctiva resulting from the long-continued instillation of nitrate of silver into the eye. Microscopic examination of a piece of excised conjunctiva showed that the epithelium was not discolored, but that a deeper layer—probably the elastic fibre-layer of the conjunctiva—was stained a dark, olive-brown color, thus agreeing with Grossman's observation in last year's ANNUAL.

Reid[213 Jan.] has made a microscopic study of a subconjunctival *pigment spot*, about the size of a pin-head, situated at the corneoscleral junction, in a boy 14 years of age. The spot consisted mainly of a series of encapsulated spaces, containing plasmoid cells charged with pigment. Lumina, which were visible in the encapsulated spaces, were probably sections of capillaries; the intervening areas which contained normal tissue were infiltrated with pigment-granules and apparently effete plasma-cells. The chief interest is the fact that these pigmented spots frequently develop into sarcomata, with their characteristic elements, this being almost certain to occur even where the presence of any elements of sarcoma do not exist. An instance of melanotic pigmentation of the conjunctiva, mostly marked in the ocular conjunctiva, the plica semilunaris, and the caruncle, has been seen by Collins[1083 v.9] in a 47-year-old woman. It had gradually increased during seven years' time from a small speck of dark pigment near the right inner canthus. The skin of the inner canthus had a dash of pigment in it. There was some pigmentation of the skin of the forehead near the roots of the hair. Her hair was raven-black and her irides were rusty-green. No ophthalmoscopic changes were visible. The patient attributed the pigmentation to traumatism. She was married, and the mother of thirteen children, seven of whom died early. There was no family history of malignant tumor. A large perpendicular fold of conjunctiva and subconjunctival tissue, extending half-way between the outer canthus and the margin of the cornea (with a narrow nebulous patch on the outer edge of the cornea), which proved to be composed of fat and dense connective tissue, most probably the result of operative interference early in life, is reported in a 17-year-old girl by MacKinlay.[1083 v.9]

Wallenberg[1035] gives 4 instances of *dermoid tumors*, the first occurring in the lachrymal caruncle, the second, which was bilateral, in the external canthi, and the last two at the inferior corneal limbus.

Leber and Wagenmann[204 Dec.,'88] have seen a case of *necrosis of the conjunctiva*, with rapid and fatal termination by general invasion of the vascular system by streptococci, in a 10-day-old infant.

Schiele[254 Dec.,'88] has made a microscopical examination of 6 cases (1 of *corneo-scleral staphyloma*, 4 of "*spring catarrh*," and 1 of so-called "*cancroid*" *of the conjunctiva*). In all there was a newly-formed inflammatory lymph-adenoid tissue between a thickened mass of proliferated stratified epithelium and the true substance of the cornea and conjunctiva, respectively. In all, as shown chemically, there was glycogen in the lymphoid, epithelial, and corneal corpuscles. He regards so-called spring catarrh as a chronic eczematous disease of conjunctivo-corneal tissue. Berlin[254 June] thinks that, instead of glycogen, there is really amyloid degeneration, as proved by the difference of solubility in water and glycerin, and by the difference in reaction with iodine upon the application of heat.

Tarnau[76, May] has seen a case of so-called *atrophy of the conjunctiva* in both eyes of a healthy woman, 40 years of age. Examination showed alopecia of the eyelashes of the lower lids, the intermarginal space being dry and glistening, with a pale, tendinous appearance, the opening of the Meibomian glands being obliterated. Between the intermarginal space and the conjunctiva there was less than .5 millimetres ($\frac{1}{50}$ inch) of thin, atrophied, shriveled conjunctiva, giving the appearance of a symblepharon after burns by quicklime. The ocular conjunctiva opposite the lower lid was injected, thickened, and somewhat raised close to the cornea. The retrotarsal folds were very slightly shortened, and the palpebral aperture did not close completely when the patient attempted to shut the eyes.

In an article upon *xerophthalmia*, A. D. Williams[109, Apr.] deems the condition a strong protest against the improper use of caustics in conjunctival diseases.

In the various forms of *corneal affection and conjunctival inflammation*, especially where there is not much excretion, Costomiris[10, Sept. 10] has applied direct massage in association with the insufflation of finely-powdered boric acid and instillations of solutions of nitrate of silver and boric acid. Commencing with short *séances*, and at first making but light pressure, the manipulations are daily increased in length and amount over a duration of two to four weeks. He has employed this method in over 4000 cases with satisfactory results.

Bell Taylor[6, May 25] has operated for an extensive *symblepharon* of the lower lid by transplanting a large piece of skin from the upper lid of the fellow-eye. One month after the operation the eye was perfectly free in all its motions, and the transplanted skin was assuming the aspect of mucous membrane. A peculiar case of symblepharon in a 32-year-old female, in which a broad attachment, extending from the lower lid to the ball and implicating the fornix, existed in both eyes, without the history of traumatism, gross inflammation, "trachoma," or pemphigus, is reported by Fischer.[353, Nov.] Cure was effected by transplantation of a large loose flap of vaginal mucous membrane. No stitches were used, but the folds of the implanted piece were kept apart by the interposition of a piece of mull. The lids were kept closed by adhesive strips. During the course of the reparative change a plastic exudation was found on the inner side of the lid, at first only around the new material and easily removable by the forceps, but later spreading over the new portion itself; this, however, seemed only to impede the healing process. The author believes that the cause for this exudation was a deep-seated affection of the conjunctiva, giving rise to perverted secretions, and finally to degeneration, with subsequent partial regeneration.

Minor[74 Jan.] gives some practical advice for the prevention and treatment of *ophthalmia neonatorum*, saying that "in all cases of vaginal discharge in parturient women the vagina should be cleansed and disinfected before the birth of the child with a 2-per-cent. solution of carbolic acid, and as soon as the child is born the surface of the lid should be washed with a carbolic-acid solution and the conjunctival sac thoroughly cleansed with a saturated solution of boracic acid." He thinks that "the eyes of all new-born children should be watched for a week after their birth, and, should signs of inflammation appear, the eyes should be cleansed with the boracic-acid solution and the conjunctiva brushed with a 2-per-cent. solution of nitrate of silver;" he properly asserts that "should the disease occur the eyes must be kept perfectly clean by frequent washings with the boracic-acid solution, which, by the way, should get in upon the eye and underneath the lids, so as to remove all matter. The lids should be brushed twice a day with a 2-per-cent. solution of nitrate of silver, and it is well to use once a day a ½-per-cent. solution of atropia, as a preventive against and a remedy for disease of the deeper structures of the eye. If the lids become swollen they can be reduced by cold compresses." His conclusions, that the "observance of the simple rules here laid down will reduce to a minimum the danger from this disease, and will materially lessen the number which is annually added to the most helpless and hopeless—the blind—of a community," cannot be too strongly advocated. In view of the fact of the importance of proper prevention and treatment of ophthalmia neonatorum, as given in last year's ANNUAL, it has been deemed wise to give Howe's conclusions[101 Mar.] upon the same subject in full, and which form a part of a report of a committee appointed for the purpose of investigating the cause and increase of blindness in the United States. Basing

his work upon the following undisputed facts—"(1) that there is in the State of New York, as in the United States, an apparently rapid increase in the number of blind; (2) that a very large proportion of blindness here, as elsewhere, is due to the purulent ophthalmia of infants; (3) that by the use of methods already known this could be materially lessened, and (4) in spite of that no systematic effort is made to do so"—he urges the following measures: "(1) to call the attention of the profession in general to the apparent increase of blindness in New York and the United States, to the importance of the ophthalmia of children, and to the efficacy of the proper means for preventing it; (2) to request the examiners of nurses and midwives to require of the candidates some knowledge of the dangers of the ophthalmia of infants and an acquaintance with the methods which are now in use; (3) to instruct our committee on legislation to formulate and recommend the passage of a law by which all midwives be obliged to report the existence of any case of ophthalmia of infants within twenty-four hours after its occurrence to the family physician, to the district physician, or to some legally-qualified practitioner. It should be the duty of every authoritative person, whether in medical circles or amongst the laity, to see that these rules are carefully observed in any district that he may have under control." For the preventive treatment, Karl Grossman[2 Sept. 28] submits the following reformatory suggestions: 1. Each midwife ought to be instructed during her time of apprenticeship about the symptoms and treatment of infantile ophthalmia. This ought to be noted on her certificate. 2. Every newborn child ought to be subjected to the preventive instillation of a weak solu-
Belitrate of silver or other suitable solution; that is, equally
the lower lion-poisonous (one drop, after the eyelids have been
lid of the fellow-eyetton-wool and the hands and arms of the child
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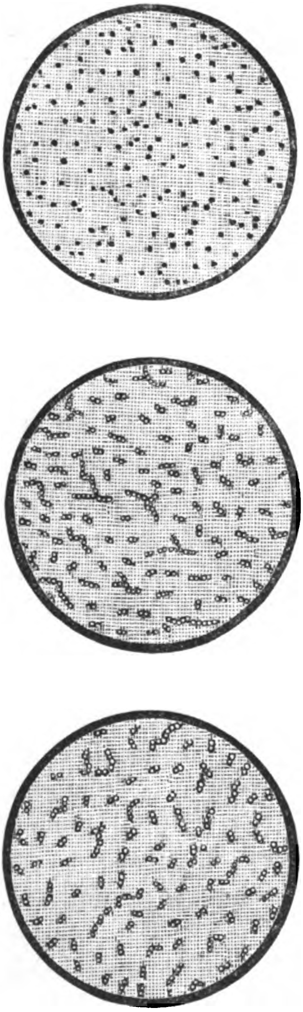
gross inflammation, "tracho he midwife omits any of these points,
Fischer.[353 Nov.] Cure was effected rawn and a fine imposed.
flap of vaginal mucous membrrrhœa neonatorum, Williams[105 Nov. 15] says
folds of the implanted piece wes unimportant what other remedy is

employed, provided no harmful applications are made. He considers the method of treatment by strong solutions of nitrate of silver unnecessary, unscientific, and unjustifiable. Sant' Anna[6, Feb. 3] prefers Crédé's method. He does not use it indiscriminately on account of the production of inflammation, though he always employs it in suspicious cases, where there has been previous inflammation of the mucous surfaces of either a former child, the mother, or even the father.

In cases of *gonorrhœal ophthalmia* seen for the first time, where one eye is seemingly unaffected, the indications, according to Gifford,[106, Oct.] are twofold: (1) to kill any germs that may possibly have gotten into the apparently well eye, but have not yet had time to develop; (2) to prevent any subsequent infection from the affected eye. The first indication is met by cleansing the skin and the lids of the unaffected eye with a moist cloth, and then applying a 2-per-cent. solution of silver, rubbing it well into the roots of the lashes and paying particular attention to the skin around the inner canthus. Two drops of the same strength solution of silver are then instilled into the lower and upper *cul-de-sacs*, after which the eye is closed. The second indication is fulfilled, in an infant, by at once hermetically closing the good eye with a pad of absorbent cotton reaching to the bridge of the nose and to the forehead, the whole outer surface being covered with several layers of collodion and the edges carefully brought into apposition with the surface of the skin. In older children and in adults he advises inserting a watch-glass between two layers of thin cheese-cloth, these being pasted to the skin at the edges, except at the temporal side, at which point it is well to leave an opening to prevent moisture from gathering on the under surface of the glass. As to the curative treatment, he has nothing new to add to cleanliness, cold, and nitrate of silver.

In the treatment of *purulent ophthalmia and dacryocystitis*, Hugh E. Jones[6, Oct. 19] advocates the method of antiseptic irrigation introduced by Browne in 1884. For the treatment of the former affection he prefers Panas's solution to trichlorphenylate of magnesium, and substitutes an ordinary Eustachian catheter for the irrigating lid-retractor. He also finds the plan useful in the treatment of strumous and membranous ophthalmia, and in some cases of sloughing ulcer of the cornea with chronic conjunctivitis. In dacryocystitis, a pierced cannula, which is closed and rounded at the distal end, and to which an irrigating tube is attached at the proximal extremity, is employed. By the aid of this contrivance, which is attached to a reservoir, the tissues are to be carefully irrigated with at least ½ pint (250 cubic centimetres) of Panas's solution.

Storet,[767 Sept.] as reported by corresponding editor Chiralt, of Seville, Spain, describes a form of "*infectious conjunctivitis*," which is partially characterized by involvement of the pre-auricular glands, the appearance of serpiginous ulcers of the corneæ, and the obstinate resistance of the symptoms to all local astringents, germicides, and disinfectants. Toelsohn describes an epidemic ("endemic," according to Maklakoff, corresponding editor, who reports the article) of conjunctivitis which he observed in a school of clergymen's daughters. There is nothing of interest in his observations. Culver[216 July] most properly describes the term "pink-eye" as a "meaningless vulgarism." Basevi[30 No. 6] gives the appearances of the micrococci found in follicular conjunctivitis. The accompanying cuts show their characteristic appearances.



Micrococci in Follicular Conjunctivitis.
(*Annali di Ottalmologia.*)

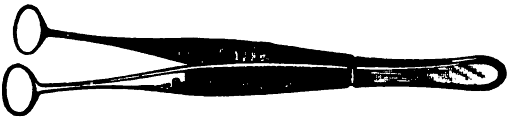
Dimissas, of Andrinople,[173 Mar.] proposes to substitute the term *chronic contagious conjunctivitis* for the well-known *granular conjunctivitis*, basing his objection to the latter term upon the fact that the granulations merely constitute an anatomico-pathological phase in the course of the disease. He divides the affection into three periods: In the first there is a chronic contagious condition without the appearance of any granulations, this lasting from six months to a year. In the second period the granulations manifest themselves as soft, depressible masses, which later become hard and rugous. According to the author's opinion, these are accumulations of lymphoid cells, which are the result of a special micro-organism acting the most readily in strumous subjects. The third period is characterized by atrophy of neoplastic tissue and cicatricial degeneration, this stage of the disease being generally known by the term *trachoma.* He prefers to distinguish in this stage (1) granular degeneration (amyloid and fatty), (2) trachoma (hard and rugous cicatrices), and (3) an atrophic form, the last being the most prevalent. In both the first and second periods he employs either Panas's solution of biniodide of mercury or a concentrated solution of boric acid, in association with an ointment of yellow precipitate, made with glycerole of starch, to be applied each evening; the best of hygiene and tonics being enjoined throughout. In the stage of granulations, cauterization by nitrate of silver immediately neutralized, alternated with sulphate of copper, is to be used in the mildest cases. In the more severe and obstinate types he prefers excision of the superior *cul-de-sac*, followed by the application of the thermo-cautery to all remaining suspected points. The ordinary complications are met by boric-acid washes, weak atropine, pilocarpine, etc. If obstinate pannus exists, peritomy is advised.

Pfalz[54, Oct. 15] opposes Saemisch's separation of follicular catarrh from trachoma. He sees the action of some causal agent in each form, and praises the operation of the excision of the palpebral folds, and, if possible, with the additional excision of a piece of the cartilage. He avoids both sutures and bandages, and depends upon corrosive-sublimate dressings followed by boracic acid. He thinks that the whole effect rests upon the assumed fact that the folds are the main sources of follicular formation. After first condemning the too free routine use of the sulphate-of-copper stick in the treatment of the trachomatous forms of granular conjunctivitis, and teaching that its employment is only to be considered during the stage of what he knows as follicular apathy (appearing in the transition from the acute to the chronic condition), Siegfried Fischer[150, Nov.] thinks that we should substitute either strong watery solutions of nitrate of silver, or even the material in substance, during the early acute catarrhal conditions. He believes that pannus is not an infrequent result of the irrational and empiric use of blue-stone. In addition, he asserts that the following rough rules, based upon careful research as to the various reliable modes of treatment, may be made: In the acute stage always employ simple antiphlogistics. If the papillary growths increase, use warm, mild astringents, especially weak solutions of nitrate of silver. As before asserted, the sulphate-of-copper stick is to be limited to those cases in which during the transitory state from the acute to the chronic an indolent condition of the follicles, with paleness, is developed, the drug being needed only as a strong stimulation in order to produce active hyperæmia. Red and yellow precipitate ointments are both to be highly recommended, especially in the early stages. He says that lactic acid does well in fibroid degeneration of the follicles. In the chronic stage electrolysis promises more than anything else. He finds that flattening, with expression of the granules, by this method exerts a beneficial influence upon co-existing pannus. He thinks that resection of large conjunctival flaps should be no longer practiced.

From a series of clinical observations and careful research into the subject, Venneman[171 Jan.] concludes that the *trachoma* of to-day seems very different, both in its local changes and general conditions, from the granulations of the famous military ophthalmia of the Belgian armies. Treitel[116 Sept.] refutes the assertion of Vossius that his method is not in harmony with general surgical principles, and especially upholds the value of his so-called "imperfect suture" (*i.e.*, one stitch on each side, avoiding any central one, so as to escape danger of corneal opacities from loss of corneal epithelium by traumatism.) His results seem to speak in favor of the method, as all but 15 per cent. appeared to have gained union by first intention. Unilateral bandage, in spite of the ordinary reasoning against it, is excused on the ground of the general results, even during its employment. The value of the use of cocaine is also upheld. Schroeder,[586 No. 14] as reported by Maklakoff, of Moscow, Russia, corresponding editor, recommends the energetic application of traumatism by metallic threads in the treatment of trachoma. Although the proceeding may appear to be very barbarous, yet the author pretends to have seen efficacious results.

In cases of old and intractable pannus, Gruening[1034] says that the operation of curetting the cornea may be commended for its directness, simplicity, and efficacy.

In advocating the methods of treatment of "chronic follicular trachoma" by expression, Prince[1, Aug. 3] says: "After the primary stage of epithelial inflammation the disease-germs infest the follicles, and the problem is therefore to remove them as they develop, with the least possible destruction of the mucous membrane." To facilitate this procedure the author has devised the instrument shown in the accompanying cut. Landolt, corresponding editor of Paris, states that Arnauts[171, Jan.] claims good results in the treatment of granulations, especially of the chronic type with old pannus, by the biweekly instillations of 1 to 120 of bichloride of mercury, following cocaine. The same salt, 1 to 400 to 1 to 500 in 1- and 2- drop instillations, three times daily, is used by the patient at his home. He thinks that the drug exercises some special peculiarity upon the newly-formed vascular system of the cornea. For the treatment of the milder forms of granular conjunctivitis, Despris[202, Apr. 26] advises the instillation of a collyrium of sulphate of copper; in more severe types, daily cauterization of the conjunctiva is adopted; while in the more chronic forms, where the granulations are hypertrophic, excision is recommended.



PRINCE'S FORCEPS.
(*New York Medical Journal.*)

Dobossedoff,[725, Nov., Dec., '88] according to Maklakoff, of Moscow, Russia, corresponding editor, associates short, straight, palpebral openings with trachoma.

Upon the assumption that microbes play an important rôle in the formation and growth of *pterygia*, Alt,[347, Mar., Apr.] after excising the growth, cauterizes the uncovered portion of the sclero-corneal tissue with pure carbolic acid, following this by very frequent instillations of bichloride of mercury (1 to 3000 to 5000) for several days.

Gordon Norrie has exhibited before the Copenhagen Medical Society a case of so-called *primary tuberculosis of the conjunctiva* in a child of 4 years of age. It manifested itself as a deep ulceration, surrounded by granulations, on the lower eyelid. There was pre-auricular adenitis. The other eye was normal. There was no family history of tubercle, nor were there any other signs of the disease in the patient. Microscopically, no bacilli could be determined, although the introduction of small masses of the diseased material into the anterior chamber of a rabbit caused the appearance of typical tubercular nodules. Following excision, perfect healing, with the production of only a slight scar, took place. (Report of Holger Mygind, of Copenhagen, Denmark, corresponding editor.)

A subconjunctival *cysticercus* in a boy aged 7 years has been removed by Werner.[2, June 27] It showed itself as a smooth, ovoid, semi-translucent cyst, the size of "a large pea" and of a reddish-yellow color. The mass was situated between the sclera and conjunctiva, and was freely movable under the latter. Microscopic examination revealed the head and neck of a bladder-worm, with four suckers and a circle of thirty hooklets, in the interior of the sac, the neck of the parasite being much wrinkled and sprinkled with the usual calcareous, corpuscular particles. Measurements of the hooklets and the appearance of the walls of the vessel proved it to be a cysticercus cellulosæ.

A case of *primary lupus* of the conjunctiva of three weeks' duration, in a boy 4 years of age, has been seen by Hill Griffith.[90, Nov.] The conjunctiva, which was rather pale and waxy-looking, was uniformly thickened, forming a regular mound of some height around the cornea, and was studded with projecting yellowish-white, pin-headed follicular (?) infiltrations. The preparotid and submaxillary lymphatic glands of the same side were considerably enlarged and hardened; the adenitis had been first noticed at the onset of the eye affection. Microscopic examination of a piece of one of the conjunctival nodules showed the epithelium to be unchanged except at the centre of the mass, where the tissue was very much thinned. In many places giant cells, surrounded by regularly-placed rows of nuclei, were found; but one spot of caseation was noticed. An *epithelioma* of the conjunctiva at the sclero-corneal juncture, which had the appearance of a pterygium, has been removed by Buffun.[776, Jan.]

An *adeno-chondro-lipoma* of the conjunctiva, occurring in a 1½-year-old boy, has been removed by Alt.[347, Feb.] Microscopically, it consisted principally of glandular tissue of the acinous type, in association with outlying cartilaginous tissue of embryonal character and aggregations of fat.

Silex[254 Jan.] reports 5 cases of *epibulbar melanotic sarcomata.* The seat of the lesion was four times at the corneo-scleral junction and once in the bulbar conjunctiva. Although the cases were observed during many years, yet orbital metastases could not be detected, even where microscopical evidence pointed toward the malignancy of the growth. Barrenechea[190 Apr.] reports a case of sarcoma of the conjunctiva, where the neoplasm, which was of the round-celled variety, exceeded the ocular globe itself in size. An additional case of conjunctival sarcoma of a round-celled variety, which had not recurred at the end of two and a half years after extirpation, is reported by Buffun.[776 Jan.] Grossman[76 Apr.] reports the history and microscopic study of a small leucosarcoma of the ocular conjunctiva about the size of a lentil. The growth was probably of six months' duration, and occurred in an otherwise healthy woman of 30. Sections of the tumor gave typical appearances of sarcoma.

Feilchenfeld[353 Jan.] calls attention to some *reflexes* excited by touching the conjunctiva and cornea, which he observed by washing them or by dropping solutions, such as atropine, on them. In the order of frequency, he mentions closing of the lids, respiratory pause, swallowing, sneezing, and, finally, a peculiar reflex consisting in a noise which is produced by making the motions of tasting with an empty mouth. The latter reflex he saw in one case only, but in this instance it seemed to be most constant.

DISEASES OF THE CORNEA AND SCLEROTIC.

An interesting case of *congenital central opacities* of both corneæ has been seen by Boyle[776 July] in a 3- or 4-day-old child. There were no inflammatory symptoms, and the child was apparently otherwise healthy. The mother suffered from supposed malaria in the six months of pregnancy, for which large doses of calomel were administered: to this the author attributes the condition.

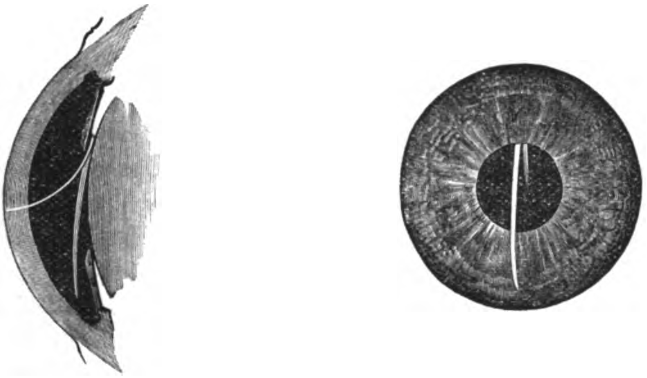
Peters[190 May] has been able to study the *effects of traumatism* upon the posterior surface of the cornea of frogs which he had produced by means of a lancet introduced peripherally. After having killed the animals at various intervals, he found that endothelial regeneration first showed itself by a covering of the defect through active motion of the existing cells, and, secondly, so-called "karyokinesis" to fill up the defect, the "pictures" of the latter never being seen before the sixth day, and always at some distance from the defect.

In speaking of the significance of the *silver images* in the inflamed cornea, Mennen[157 Nov.] says that his investigations on the cornea have led him to the conviction that Hassloch's description and views, announced first in 1878, are correct. In conclusion, he asserts that "though not much of importance can be added to Stricker's assertion concerning the theory of keratitis, I believe I have contributed somewhat toward the understanding of it, since I could show that in formation of inflammatory corpuscles not only the protoplasm participates, but also the living matter stored up in the basis substance. As long as the inflammatory corpuscles remain connected with one another by means of living matter, the inflamed cornea-tissue has not ceased to be a tissue. From this either pretty normal tissue may result or the formation of a new and transparent tissue, which we term cloudless or cicatrix. Not until the inflammatory corpuscles separate from one another does suppuration or formation of abscess result. Pus, however, as has long been recognized, is no tissue, and unable to form tissue. In no stage of inflammation of the cornea, where the inflammatory process is located in the centre, does the migration of colorless blood-corpuscles, in the sense of Cohnheim, play any part whatever."

Leber[204 Ap.] has made some observations which prove that in the substance of the cornea, under certain conditions, fibrin coagulation may occur, and that sometimes the fibrin separates into very peculiar forms, so that it is often difficult of recognition. He thinks that the rod-form structures in the cornea, previously described by Baumgarten, were such fibrin coagulations that were probably separated from blood effusions into the anterior chamber.

Vossius[204 V.26, No.2] gives description of 2 cases of a peculiar greenish *discoloration of the cornea* following traumatism. He deems that it is related to corneal hæmorrhage. The greenish tint he attributes to the presence of hæmatic pigment. This condition he considers as one of the accidents partly dependent upon hæmorrhage into the anterior chamber and neighboring tissues, especially into the corneo-scleral junction in front of Descemet's membrane and around the canal of Schlemm. The most interesting portion of the article consists in the description of innumerable pale-yellow, variously-formed, highly-refractive particles, each being sharply defined in outline. These bodies, which had been described by Baumgarten, have had various suggestions offered as to their nature, but none of which were in any way satisfactory. Vossius at first considered them to be changed blood-corpuscles, but, upon further examination by Leber, illustrating fibrin coagulation in the corneal interspaces, he abandoned this view, and makes the suggestion that they represent products of colloid or hyaline degeneration of the corneal fibrillæ. The article is illustrated by several most excellent plates. To this latter view of Vossius, Leber[204, June] takes exception, and considers these particles to be fibrin, as he has stated, basing his views upon chemical study and microscopic investigation.

Meyer's case[190, Jan.] of *keratitis bullosa,* in which there were two cilia in the anterior chamber, one of which had penetrated Descemet's membrane, seems to lend support to Brugger's belief of permeation of fluid into the corneal parenchyma. The accompanying cuts give a very good idea of the relative positions of the cilia.



Cilia in the Anterior Chamber.
(*Centralblatt für Praktische Augenheilkunde.*)

Two cases of penetrating *wounds of the cornea* by a piece of glass and a steel punch, seen by Gastaldo,[607] are reported by Chiralt, of Seville, Spain, corresponding editor. In each instance the protruding iris was excised and the incarcerated portion of the membrane was pushed back into the anterior chamber, these procedures being followed by alternate instillations of atropine and eserine.

Bronner[1088, v.9] gives the histories of 3 cases of Grandclément's so-called *traumatic keratalgia.* He thinks that "the interesting features of these cases seem to be that a comparatively small lesion of the cornea should give rise to such intense pain, and that this pain should last in all cases for exactly 3 days, and should persist in spite of all local treatment; and, lastly, that this pain should recur so regularly every morning for months, or even years." He finds that the long-continued use of massage and hot fomentations seem to give relief in some cases, but in others to have no effect whatever. In these latter cases he believes that the only effectual mode of treatment is to remove the macula corneæ with the knife. As to the pathology, he supposes that there must be some intense irritation of the ends of the nerve-fibres of the cornea; whether this be due to some pathological process in the fibre itself or the result of some chemical change he does not pretend to say. Bronner[2, June 22] recommends the use of hot fomentations for several weeks' time, followed by massage with yellow oxide-of-mercury ointment. If these remedies fail, he advises the excision of any existing cicatrix.

Wolfe[6, Mar. 28] has corrected a total *staphyloma* of the cornea, resulting from a blow, by removing an oval-shaped flap from the centre of the cornea and bringing the edges of the wound together by means of fine silk sutures, the lens being removed during the operation. He limits the procedure to cases where the distention has taken place at the expense of the cornea alone.

Maklakoff, of Moscow, Russia, corresponding editor, writes us that Serguieff[586, No. 14] describes a case of "*sclero-ophthalmia*," in an infant of 2 weeks, where the cornea presented similar opacities to those seen in the sclerotics, so that it was very difficult to distinguish one from the other. In two months' time the cornea commenced to clear.

Powell[282, Feb.] has had a case of acute *scleritis* in a woman, occurring at the time of the climacteric. He attributes the main cause to a nervous shock.

Binocular ribbon or *band-keratitis* in a 65-year-old man has been seen by Boyle.[776, July] The bands extended in a transverse direction across the centre of each cornea, in a position corresponding to the palpebral fissure. The opacity, which was about 3 millimetres ($\frac{1}{8}$ inch) in the centre, narrowed slightly at the inner and outer margins, the densest portion being at the centre and toward the outer border of each cornea.

Frank S. Billings[170, Apr.] has made a most careful study of *keratitis* contagiosa in cattle. The disease starts with a catarrh of the conjunctiva, which is followed by purulent infiltration and vascularization of the cornea. Notwithstanding the apparent severity of the external lesions, the eye makes a good recovery, except in those rare cases in which the abscess perforates the cornea and "prolapse of the lens" occurs. To prevent extension of the outbreak, the affected animal should be isolated. The treatment advised consists in hanging before the eyes cloths kept constantly wet with cold water. The local application of washes or remedies was found to be not only useless but harmful. It may be fair to assume, in view of the author's failure to produce direct inoculation by means of the conjunctival discharge, that the disease may have been produced by the introduction of some deleterious agent into the system by the food of the animal.

Adler[190 Oct.] describes a peculiar form of inflammation of the cornea, to which he gives the name of "*keratitis subepithelialis centralis.*" He says that it is remarkable for its form and its association with catarrh of the conjunctiva. It is mostly unilateral, and occurs during the wet and cold seasons of the year. It is not painful, and seemingly does not materially impair the vision; for these reasons it is readily overlooked, and is generally thought to be an ordinary sclerotitis with catarrh. The primary secretion never becomes purulent, and the prodromic catarrhal stage generally lasts about eight to twelve days, when suddenly the characteristic keratitis appears. This latter consists of numerous punctate infiltrations in the superficial layers behind the epithelium, which appear either in isolated points or groupings. They appear as minute disks, and their size may be best understood by comparing them with the numbers 100, 90, and 80 of Plate III, and 70, 65, and 50 of Plate IV, of Burkhardt's test-dots. Atropine and cold compresses were successfully employed.

Magnus[54 Oct. 1] gives an abstract of Mandelstamm's lecture on corneal inflammations (*keratites*) and their treatment, viewed from an etiological stand-point. Mandelstamm recognizes the following three groups: 1. Conjunctival or superficial keratites, to which belong all mycotic forms, traumatic, neuro-paralytic, and those of inanition, besides all those other varieties which are non-mycotic, and are associated with conjunctival disease. 2. Scleral keratites, which almost exclusively depend upon dyscrasia, *i.e.*, which have an endogenous excitor existent in the blood. 3. Choroidal keratites, dependent upon propagation from the uveal tract on to Descemet's membrane. The therapeutics vary according to the group, although atropine is generally discarded. Lubinsky,[725 Ja.] according to Maklakoff, corresponding editor, has seen a case of *keratitis dendroides mycotica exulcerans.* He says that the case is very interesting, but that the author fails to prove the mycotic nature of the affection. The corneal infiltration occupied the superficial layers, and appeared branch-like in form. The cure was slow and tedious, and the cornea presented after-traces of the affection.

In the treatment of deep *corneal ulcerations* not complicated by iritis, White[43 Oct.] instils eserine until the pupil is contracted, when, if perforation does not threaten, he carefully cauterizes the ulcer with a 2- to 3-per-cent. solution of nitrate of silver, followed by applications of hot water.

Mitivier[60 Mar.16] has operated upon an *opaque staphyloma* by cutting it free from its base and inserting delicate sutures through the lips of the wound in order to prevent hernia of the iris.

Valude[78 May] has successfully tried Gama Pinto's operation for repairing a *break in the cornea,* when complicated by prolapse of the iris, by means of a conjunctival flap, after having disengaged the iris from the lips of the wound.

A most thorough review of the literature of *keratoplasty* and the transplantation of mucous membrane and skin has been made by Stellwag von Carion.[283 Nov.27 to 29] Transplantation he considers the more successful, but prefers oral and vaginal mucous membranes. He thinks that large flaps should be employed on account of the great motility of the globe. One of the great hindrances to success is the desquamation of the epithelial covering and the development of granulation. In illustration of this he reports an interesting case. In Chisolm's case[59 Jan.5] of corneal transplantation, the condition noted six months after the operation is that the disk is grayish in color, with red marginal tracings, although no blood-vessels run entirely across it. The author says, however, that "vision has increased to detection of large objects at a distance of 10 feet (3 metres). He considers a perfect elastic membrane of Descemet and a normal anterior chamber as indispensable conditions for operating. A. R. Baker[347 Jan.] reviews the literature on the subject of corneal transplantation, and assumes, from our present experience with the operation, "that the graft will become adherent by the methods either of Wolfe, Dürr, or von Hippel; it will remain clear for a short time, but will eventually become opaque in a vast majority of cases, and may lead to phthisis bulbi; that there is some common cause for failure which is either inherent in the eye operated upon, in the grafts themselves, or in the method of operating." He further assumes that it is advisable that other methods of treating corneal opacities, such as scraping, daily friction, galvano-cauterization, etc., should be tried, as they may prove more fruitful fields for investigation and experiment.

Dodge[284, Mar.] has successfully treated a *wound of the cornea* extending into the sclerotic by the insertion of sutures through the sclerotic and conjunctiva.

Retton[2, Feb.28] advocates a more general use of the cautery in treatment of *ulceration of the cornea*, and especially recommends its employment in strumous ulcers of children. He thinks that the application of the heat by the thermo-cautery is the preferable plan.

From an experience of 250 performances of the operation of *peritomy*, Ford[6, June 16] is of the opinion that the procedure yields unexceptional results in troublesome cases of ulcerative, vascular, strumous, and suppurative keratitis. Resource to the method is to be had only after milder measures prove useless. He has also found it of some value in chronic keratitis, with threatening staphylomata and degeneration of corneal tissue.

Two cases of *staphyloma*, the result of purulent ophthalmias, are reported by Fernàndez,[179, v.34, No.11; 74, Nov.] the second being complicated by adherent leucoma. Both were operated upon, the first by means of the thermo-cautery, the second by abscission of the eye. Based upon the assumption that, "if a diametrical incision would relieve corneal tension, why should not a series of shorter incisions, whose total length should be equal or nearly equal to the length of the diametrical incision, do the same? and, if so, why should not these shorter incisions be made at the base of the cornea, where they should cause neither damage to the sight nor disfigurement?" G. E. Walker[187, July] makes a series of pericorneal incisions for the relief of corneal tension in the graver inflammations of that membrane. The operation, which he styles "perikerotomy," is performed in a manner similar to that employed in paracentesis of the anterior chamber, the punctures being repeated until the circumference of the cornea has been traversed. In minor cases the incisions can be separated by spaces equal to two or three times the widths of the cuts, whereas, in more severe types of disease, the distance between the incision must be narrowed to the widths of the cuts themselves, care being taken in every instance to avoid the escape of aqueous. After the operation, water-dressing is to be applied and both eyes are to be kept closed. Atropia is not instilled unless iritis is present.

A. D. Williams[109 Nov.] reports the removal of a *congenital dermoid tumor* about the size of a pea, situated at the outer sclero-corneal junction of the eye of a 10- to 12-year-old boy.

A case of *xerophthalmos* has been seen by Meighan[213 June] in a man 30 years of age. The corneæ were hazy and dry. The conjunctivæ, which were movable on the subadjacent tissue, had the appearance of parchment.

A case of *amyloid degeneration* of the cornea in a quadroon aged 52 years has been seen by Fravel.[196 Apr.] The cornea was cloudy, and a well-defined arcus-senilis existed. The tension of the eyeball as well as the opacity of the cornea increasing, section of the cornea with evacuation of the anterior chamber, and a small piece of the membrane was swept off. With the free-iodine test it gave the "characteristic deep-blue color."

DISEASES OF THE IRIS.

Clark[249 Mar.] reports a case of isolated *rupture of the iris and choroid* caused by a rebounding rifle-ball. A web-like opacity existed in the lens at a point opposite the perforation in the iris, whilst the apparent rupture in the choroid showed no indication of hæmorrhage, and failed to exhibit any pigment massings. In a case of sclero-corneal wound with prolapsus iridis, Collins[2 June 22] removed a cilium from the anterior surface of the iris, within the anterior chamber, by the means of a Tyrrell hook and an iridectomy forceps.

A curious case of grave *iritis*, evoked by the hairs of a caterpillar, which had penetrated into the interior of the eye, is reported by Weiss.[254 Aug.] The patient, a laborer, busy destroying a large number of caterpillars in a forest, had one—a specimen of the *gastropache pini*—fall upon his eye, immediately causing a moderate irritation, which readily abated by the use of cold-water compresses. One month later there was an exacerbation, which recurred so often that Weiss concluded to make a most careful examination of the organ. He was rewarded by finding some fine hairs of the caterpillar in the cornea (which he removed), with four or five very small ones which had penetrated the iris vertically to its anterior plane. After failing with the ordinary means, and fearing iris inflammation with the formation of plastic exudation, he performed an iridectomy which excised the portion of the membrane containing the foreign bodies. Good recovery took place.

A case of *irido-dialysis* is reported by Hamenway.[185 Oct.] The patient required a glass made sufficiently translucent opposite the eccentric pupil to exclude a disturbing monocular diplopia.

Noticing in 7 cases of *heterochromia iridum* the liability to disease on the part of the lighter eye, Sym[76 July] inquires: "What I should like to know is, are 'blue eyes' more liable to diseases of the colored vascular tunic than 'brown' ones, or is the above series merely a coincidence? Is there some condition manifested by want of pigment which predisposes to inflammatory and degenerative changes?" He remarks that "it would be interesting to find out what proportionate cases of choroiditis, etc., relatively to the population, occur in persons whose eyes are blue and in those whose eyes are brown." He would also like to know whether others have noticed, in their cases of heterochromia iridum, a greater liability to diseases of the vascular coat on the part of the "blue" eye.

Schapringer[254 Dec.,'88] reports a case of *intra-ocular hæmorrhage, with paralysis of the sphincter iridis*, caused by indirect traumatism through a fall upon the occiput. He considers that the probable source of the hæmorrhage was a slight tear in the iris. He doubts the rarity of this occurrence, and directs attention to this symptom in all similar instances.

Rockliffe[1083 v.3] gives the notes of a case of *monocular suppurative* (?) *iritis*, as seen in a hearty 8-year-old girl of healthy parentage. He is inclined to think that his case is one of suppurative iritis, somewhat curtailed by the treatment prior to the actual formation of pus; the lymph first binding the iris down to the capsule and oozing beneath the free margin, occluding the pupil; the nodules, being merely accumulated inflammatory tissue, pushing the delicate iris forward, and then passing backward to the ciliary body and vitreous, and eventually to the choroid. He believes that the ciliary staphyloma was formed at the time the ciliary body was most swollen in a similar manner to the iritic nodules.

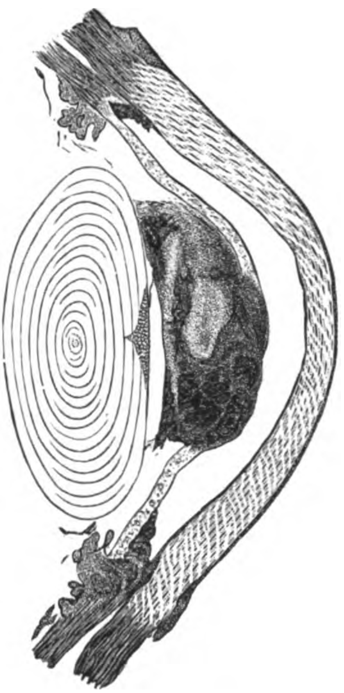
In the treatment of purulent metastatic *iridocyclitis and iridochoroiditis*, Schoeler[41, No. 49] recommends antiseptic injection of salicylate of sodium, carbolic acid, etc., into the globe itself. In the discussion which followed, Schweigger most pertinently remarked that he would only make use of such procedures when nothing could be expected from other therapeutic measures.

Collins[1033, V. 9] reports a case of what he terms "*granulation iritis from non-penetrating trauma*," supposed to have been occasioned by a blow. There was no penetrating wound, but much ciliary injection was present. A week later there were several small, pinkish-gray nodules on the anterior surface of the iris, accompanied by evidences of plastic formation. Cyclodynia existed. In the discussion which followed, Hill Griffith said that he had seen several similar cases (non-traumatic in type) which he thought were probably tuberculous, and for this reason he doubted that the above case had been caused by an injury.

Leplat[171, July–Sept.] has observed 5 cases of iridocyclitis in the aged in which there was increase of intra-ocular tension. He thinks that it is usually seen in syphilitic and rheumatic subjects, although it may appear idiopathically. Corneal puncture, with injections of pilocarpine, seem to be of value in this affection.

A peculiar instance of *multiple cysts* of the iris in both eyes is noted by Henry W. Williams.[1034] The patient was a 9-year-old girl. In the right eye a large projection, slightly folded, having a resemblance to a large cyst, extended downward from the upper margin of the pupil, and a similar growth from the temporal border. At the lower and inner parts of the field of the pupil were two small, pedunculated growths of similar aspect. All these were the color of the iris, which had a healthy, fibrillated appearance. They were dark-brown, smooth, appearing as if made up of sacs of distended iris-tissue rather than like ordinary cystic growths. In the left eye two somewhat convoluted cysts of like aspect filled the pupillary space from above and below. Atropine caused no obvious dilatation of a central, somewhat square space, through which there was a little oblique vision. A transparent cyst of the iris, in a man aged 20 years, has been seen by Benson.[2, May 11]

It had first shown itself about one year previously, disappeared again for a few months, and reappeared. After the last recurrence the cyst grew rapidly until it filled three-fourths of the anterior chamber, when it remained stationary. It lay in contact with the cornea over more than half its internal surface, and was accurately applied to the angle of the anterior chamber. After removal the cyst-wall was found to be almost perfectly transparent, except where it was incorporated with the pigmented portion of the iris. The cyst itself was found to be lined with a layer of compound epithelium, five or six layers deep, and contained a clear fluid indistinguishable from aqueous. Schmidt-Rimpler[204 Apr.] publishes a case of *idiopathic cyst of the iris*, which he thinks throws more light upon his belief that they are the result of encapsulation of an iris-crypt by bands which have become thickened and enlarged by some pathological process.



SARCOMA OF THE IRIS.
(*Archives of Ophthalmology.*)

From a study of the reported cases of *primary sarcoma* in the iris, Andrews[1 Jan. 1] decides that, if the case be seen in the first stage of the disease before any signs of surrounding irritation have appeared, it is best to immediately remove the growth by an iridectomy so placed as to include the tumor in the coloboma; whereas, in those cases in which the second stage has been reached, giving rise to inflammation and increased intra-ocular tension, he is opposed to any attempt to save the eye, and believes that enucleation should be performed for the reason "that we are in such cases unable to differentiate between a simple inflammatory and an extension of the malignant process." Webster and Van Giesen[249 Mar.] report a case of melanosarcoma of the iris in a female of 60 years. The tumor was 4 by 3 by 3 millimetres ($\frac{1}{6}$ by $\frac{1}{8}$ by $\frac{1}{8}$ inch) in size. It was attached to the posterior surface of the iris and encroached on the pupil. Microscopically, the growth consisted of two portions: one composed of closely-packed, small spindle-shaped cells, some of which were pigmented and lying in a sparingly pigmented basement substance; and the other, which constituted more than one-half of the tumor, consisted almost entirely of different-sized pigment-granules lying in a scanty, delicately-fibrillated stroma. Ayres[9, Aug. 3] reports 2 additional cases, one of the small round- and the other of the small spindle- cell variety. A tumor of the iris, which apparently showed pigmented sarcoma, has been reported by Buffun.[776, Jan.] A specimen, which was obtained by an iridectomy, proved, by an after-enucleation, to be a continuance of a large melano-sarcoma which had sprung from the adjacent ciliary body and choroid. Sanford[2, May 18] adds an additional case of the round-celled variety in a child aged 5 years.

Gordon Norrie[778, p.304,'88] has seen a case of *oscillatio pupillæ* in a man aged 33, which consisted in alternating contraction and dilating of the pupils. The movements of the irides, which were synchronous, were especially noticeable by dim light. Excepting a hyperæsthesia of the retina (so called), nothing was to be seen ophthalmoscopically. (Report of Holger Mygind, of Copenhagen, Denmark, corresponding editor.)

Gibson and Felkin[15, Jan.] have noted an instance of marked contraction of the pupils, with loss of reflex action to light, in a case where sodium salicylate was being used.

DISEASES OF THE CILIARY REGION.

Snell[1033, V.9] adds the clinical histories of 2 cases of *sarcoma* of the ciliary region to the list. The first was that of the pigmented variety, whilst the second presented the characters of a pigmented round-celled growth.

Kerschbaumer[204, Dec.,'88] surveys the manifold changes which take place in the *uvea of advanced life*, which she deems it important to understand before being able to judge of pathological conditions: these begin about the 40th year. Six drawings are given of the ciliary region in cases of various states of refraction. The differences noted she thinks are dependent upon a difference of development of the circular or meridional muscle-fibres. As age advances, atrophy of these fibres, with hyperplasia of connective tissue, just as elsewhere throughout the body, take place. The ciliary processes are consequently longer, stronger, and more branched, which causes a deepening of the recess and a flattening of the antero-posterior diameter of the anterior chamber, the connective tissue of the processes themselves assuming a hyaline appearance. The vessels appeared sclerosed, with points of dilatation.

DISEASES OF THE LENS.

In a comparative study of the *composition of the human lens* in health and in cataract, and its bearing upon operation for the latter, Collins[76 Nov.] finds his results in almost complete accord with those of Priestley Smith. After giving the method of incineration in detail, he adds a tabulated analysis of his cases. As regards the weight of the healthy lens, there seems, with one exception, to be a regular increase with age. The average weight of his six clear lenses was about 2 decigrammes (3 grains), the amount of contained water remaining remarkably constant at about 70 per cent. Curiously, the amount of total solid appears to remain tolerably fixed throughout life. This, however, is in contradistinction to Deutschmann's results of increase with age (a position that Collins thinks untenable by reason of the transport to which Deutschmann's material was subjected).

Turning to his *cataract* series, we find that in not a single instance did the absolute weight approach the lightest of the clear lenses; this is both interesting and remarkable, when we remember that the healthy lens continually increases in weight with advancing years. As to the composition of the cataract in respect to water and solids, he finds both to be absolutely less than in healthy lenses. He thinks that both here as well as with a clear lens individual peculiarities, rather than any age-changes, determine the ratio of water and solids. These assertions are remarkable in spite of the fact that none of these cataracts were what could be called *cataracta reducta.* He believes that "the cataractous process is not an exaggerated senile change, but due to disturbed nutrition of quite another nature, in so far as chemical and not morphological changes are concerned." In reference to the practical question, he remarks that "if the argument be advanced that early extraction should be adopted in cases of immature cataracts in persons past middle life, because the cataract in such cases is likely to be hard (*i.e.*, rich in solids) on account of age, apart from the cataractous change, then my analyses afford no ground for any such generalizations. In deciding the question of operation on immature cataracts, then, I submit that we must be guided by the circumstances of the individual case, especially the general and local conditions of nutrition, particularly diathetic and vascular conditions."

Hirschberg[190 Dec.,'88] figures two sketches of *bleb formation* on the posterior surface of the capsule of the lens in incipient cataract. He finds that in the majority of his yet unpublished observations the condition was particularly noticeable in the diabetic variety of lenticular disturbance.

By the employment of the "loupe," Magnus[254 Oct.] has made a series of investigations upon the initiatory appearances of *incipient senile cataract*. He pays especial importance to the value of using the white reflex of the optic disk as a background against which to study the changes, claiming that in this way the minutest details can be seen with unusual distinctness. He considers two types: first, where the changes begin equatorially, and, second, where they begin centrally. In the former he finds that there is an anterior and a posterior zone of primary opacity. The latter, which seems to develop the earlier, advances much the more rapidly, and, as a rule, it proceeds from the periphery toward the centre. This type is by far the more frequent, amounting in Magnus's cases to 77 per cent. The second type, in contradistinction to Schoen's statement of its non-existence and the non-appearance of nuclear sclerosis before the age of 60, he believes in. He notes, in opposition to Schoen, a system of cavities and crevices filled with a transparent liquid as the first change; these may assume pear-shape, spindle-like, globular, or fine, granular-like forms. The pear-shaped (or, more rarely, ovoidal) occur exclusively in either the anterior or posterior cortical, and are parallel with the equator. As the cataract ripens they either fuse, to form long opalescent bands lining the equatorial region, or they enlarge into long prismatic structures which coalesce to a single point in the equatorial zone. Risley[112 Mar.] concludes, from a study of incipient cataract, that "while opacity of the lens is a disease of advanced life, it does not, in all probability, depend upon senile change, but is originated in local pathological states involving the nutrition of the eye itself; that hence in the stage of incipiency it is amenable to treatment by such measures as are calculated to remove the choroidal disease upon which it depends; if these deductions be true, we are justified in giving a more hopeful prognosis to many persons who apply for treatment with incipient cataract, and that, if treatment fails to arrest the progressive degeneration in the lens by virtue of the treatment adopted, the eye will be in a better condition to submit to the trials of operative interference."

Doyne[2, Dec. 22, '88] has noted a difference of eleven dioptres between the centre and periphery of a crystalline lens which produced the appearance of a nuclear opacity.

Gunn[76, Aug.] believes that *traumatic cataract* is produced by the action of the chloride of sodium of the aqueous on the globulin of the lens, teaching also that the solution of cataract after wounds or punctures of the anterior capsule is due to the fact that globulin is normally soluble in weak solutions of chloride of sodium, such as we have in the fluid of the anterior chamber.

Correspondent "Q."[235, Dec., '88] cites a most curious case in corroboration of previous reports that in cataract operations in China an unusual amount of cortical substance is found. He gives the notes of the case in a man of 66 years of age, in whom the cataract was found to be soft, with no trace of a nucleus, "the whole mass being generally pressed out, leaving a clear pupil." Tatsuca[200, Mar.] gives the details of a curious case of cataract in a female aged 22 years. Two cases of *zonular cataract* are reported by Coggin.[347, Mar., Apr.] The first was seen in a boy 10 years of age, the second in a man of 39 years. Hosch's[254, June] case of rupture of the anterior capsule without involvement of the ocular tunics or luxation of the lens from contusion of the globe is most interesting, as illustrating the tendency to spontaneous cure by the formation of Leber's "fibrin cap" over the bared lenticular substance. Kuhn's 2 cases[8, Jan. 17] of the triple form of zonular cataract, occurring in brothers, is of interest and great rarity in having existed in the patients' mother and maternal grandmother; all the cases showed evidences of rachitis.

J. M. Ball, Jr.,[60, Dec. 29, '88] contributes an interesting case to the question whether a *monocular cataract* should be operated upon or not. The patient, a 69-year-old man, had been "blind in the right eye eleven years," with good sight in the left eye; was operated upon successfully, giving normal vision in each eye with lenses of 14.5 D. difference. From the history of the case, it is probable that the operated eye is being used for near work, whilst the fellow is employed for distance alone.

A case of *traumatic dislocation* of the lens, followed by symptoms of fulminating glaucoma, is reported by Saunders.[2] The patient made a good recovery after extraction of the lens.

In comparing the two *methods of extracting cataract*, with and without iridectomy, Chas. S. Bull[1] gives the advantages of simple extraction without iridectomy, as follows: "1. It preserves the natural appearance of the eye—a central, circular, and movable pupil. 2. The acuteness of vision, other things being equal, is greater than that after the old operation. 3. Eccentric vision and orientation are much better than by the old operation. 4. Small particles of capsule are not so likely to be incarcerated in the wound, and thus act as foreign bodies and excite irritation. 5. The necessity of after-operations is probably not so great as after the old operation."

The disadvantages of simple extraction are as follow: "1. The technique of the operation is decidedly more difficult. The corneal section must be larger in order that the extrusion of the lens may be facilitated, as the presence of the iris acts as an obturator or obstacle to its passage. The corneal section must be performed rapidly, so as to avoid the danger of the iris falling on the knife in being excised. The cleansing of the pupillary space and the posterior chamber is much more difficult than after the old operation. 2. Posterior synechiæ, secondary prolapse, and incarceration of the iris are more frequent than after the old operation. 3. The operation is not applicable to all cases. The objection, however, applies to all operations."

Indications for performing iridectomy are formulated as follows: "1. When the vitreous is fluid or the zonula is ruptured, causing non-presentation of the lens and prolapse of the vitreous. 2. Insufficient length of the corneal section, with prolapse of the iris. 3. Bruising of the iris during the operation. 4. A stiff, unyielding sphincter. 5. Irreducible prolapse of the iris after completion of the operation.

He gives the following general antiseptic rules: "1. The removal and exclusion, as far as is possible, of all bacteria by the employment of unirritating aseptic fluids for all purposes of cleansing and irrigation, the best of these being boiled water or boiled boric-acid solution. 2. The employment, whenever necessary, of some really valuable antiseptic solution, such as chlorine-water, mercuric bichloride, or silver nitrate, the indications for their use being the appearance of the slightest muco-purulent secretion from the conjunctiva or cloudiness of the lips of the wound. 3. The fearless employment of the galvano-cautery to the whole length of the corneal wound if the lips of the wound show any signs of infiltration. 4. The performance of the operation with the most extreme neatness and accuracy, and with the minimum of traumatism. 5. Endeavor to obtain primary union of the wound by careful removal from between the lips of the wound of all foreign substances and by perfect coaptation of the edges, and the maintenance of the most complete immobility of the organ possible until the wound is firmly closed."

The author says, of the 100 eyes on which this operation of the "simple extraction" of cataract was performed, useful vision was regained in all save one. This case was that of a patient whose eye had been rendered entirely blind by frequent attacks of irido-choroiditis, and the lens was removed simply to allay the severe pain and possibly to aid in quieting the inflammatory process. Not a single eye was lost from suppuration. Little[2 Feb. 28] reports the result obtained in a series of 1248 cataract extractions in support of the method by iridectomy. His main objection to extraction without iridectomy is the difficulty encountered with the iris, prolapse or bruising at the time of the operation, and prolapse or adhesions during the healing process; this he considers the *bête noire* of the operation. His other objections are "the difficulty of clearing the pupil of cortex, the possibility of hæmorrhage into the anterior chamber, and rupture of the vitreous, all of which are no hindrance to the successful completion of the iridectomy operation, but are rather serious obstacles to the other."

From the results obtained in his "second series of 100 cataract extractions without iridectomy," Knapp[249 Mar.] concludes that the simple method is not only the best, but the safest. He asserts that the iris, spread out as a *velum interpositum* between the corneal section and the ciliary body, protects this, the most susceptible part of the eye, from the deleterious substances that may enter it through the wound. Teale,[2 Sept. 27] in the operative treatment of immature cataract, employs a narrow-bladed Sichel's cataract-knife, which is made to enter the cornea close to its outer margin, about the level of the "horizontal equator." After traversing the anterior chamber, he makes a counter-puncture at a corresponding point at the inner margin of the cornea. As soon as the counter-puncture is well established, and the point of the knife projects about $\frac{1}{16}$ to $\frac{1}{8}$ inch (1.5 to 3 millimetres), the edge of the knife is turned rather rapidly forward, and the section is completed by a vertical cut through the remainder of the tissue of the cornea, the horizontal portion of the incision being consummated about midway between the margin of the pupil and the base of the iris.

He says that "after the extraction of the cataract the shallow flap which has been made falls into its place and fits accurately, leaving an absolutely smooth surface. The perfect cases are most perfect, and are unapproachable by any operation of which iridectomy forms a part, and the less perfect cases obtain, as a rule, very useful sight."

Hewetson$^{2}_{\text{Sept. 27}}$ asserts the entire safety of the so-called "trap-door cut." He employs thorough antisepsis, closely clipping the eyelashes and using the dry eucalyptus spray. He is inclined to lay great stress upon not speaking over the patient, convinced that this is a true source of danger, as few are free from carious teeth, and it is well known that pathogenic microbes infest the mouth and decayed teeth. Iridectomy is only resorted to where it is demanded by some well-understood complication. Snell$^{2}_{\text{Sept. 27}}$ dispenses with fixation-forceps and speculum. He uses a Graefe knife and makes the section below, both puncture and counter-puncture being in the sclero-corneal junction and the summit of the flap midway between the edge of the pupil and the periphery of the iris. He has found prolapse of the iris to occur but rarely in extraction without iridectomy. For the prevention of suppuration in cataract operations, Berry$^{2}_{\text{Sept. 27}}$ recapitulates his views as follows: "1. Asepsis of all the instruments used could be readily effected, and thus one of the most important sources of infection avoided. 2. A 1 to 5000 corrosive-sublimate solution, especially when frequently poured on the eye during the operation, probably diminished the risk of, though it certainly did not render altogether impossible, corneal suppuration as the result of self-inoculation. 3. Attention to well-known rules in connection with the details of the operation was of great importance, especially the proper use of a sharp knife. 4. Septic iritis was less readily under the control of the corrosive-sublimate solution, and probably best avoided by the performance of a preliminary iridectomy."

Mackinlay$^{2}_{\text{Sept.17}}$ is in favor of an iridectomy, in operating for senile cataract, either at the time of the extraction or by preference as a preliminary operation, done at least some weeks before. The iridectomy should be moderately small and have nearly parallel edges (the coloboma, in fact, should be like an inverted key-hole). Frost$^{2}_{\text{Sept.17}}$ prefers to perform an iridectomy, the objections to simple extraction being the stretching and bruising to which the iris is subjected and the fact that fragments of cortex get behind the iris, where they are out of sight and out of reach.

Mules$^{2}_{\text{Sept.17}}$ adopts Meyer's view that "patients occasionally carry in themselves germs which no care on the part of the operator could prevent from developing severe and destructive changes in the eye," and accepts it as a true explanation of many otherwise puzzling cases. Collins$^{2}_{\text{Sept.17}}$ considers that the experiments of Chauveau tend to show that septic fluids absorbed from the intestinal canal or by intra-venous injection may occasion acute suppuration *in loco.* He always operates without iridectomy, and thinks that the average results are better. He prefers peripheral capsulotomy. Grossmann$^{2}_{\text{Sept.17}}$ has abandoned iridectomy, and thinks that he has no reason to be dissatisfied. Little,$^{2}_{\text{Sept.17}}$ who has had a large experience in extraction with iridectomy, and having always obtained excellent results, "equally good to any statistics hitherto recorded by other operators," is not disposed to substitute any other operation, unless it be clearly shown that that operation is a better one, and says that "it certainly had not yet been shown that extraction without iridectomy had been attended with better results, if so good." With the preliminary note, "the technique is the primary and essential element in extraction of cataract," Wolfe$^{22}_{\text{May 22, July 8}}$ says he prefers to perform iridectomy two weeks before extraction. The coloboma is made downward in the vertical meridian, and is rounded so as not to disfigure the eye and to leave the ciliary margin intact. The advantages of this preliminary operation is that the anterior chamber is not obscured by hæmorrhage from the iris and the lens required to be extracted unseen in the dark, as it must be when iridectomy and extraction are performed at the same time. He says: "At the time of extraction the patient is made to recline on his back, and his head is held by an assistant. A speculum is introduced and the eye is fixed with forceps. The section is made with Graefe's knife, which is introduced at the junction of the cornea with the sclerotic, and the counter-puncture is made at the opposite side, so as to produce an arched incision, extending along rather more than a third of the corneal circumference. Before the section is finished the point of the knife is directed to the lens-capsule, which is opened; the knife is then withdrawn and the speculum removed. A corneal bridge is thus left, which prevents the escape of vitreous, so that we have the eye under our control and may manipulate it with freedom in the subsequent stages. The thumb and index finger of the left hand are now raised as a speculum to separate the eyelids; the cystitome is introduced, the capsule more widely opened, and if the lens has a tendency to sink or to shift, it is brought into position for easy exit. Another moment of rest is given; then the lids are again opened, and a blunt-pointed corneal knife is introduced and the corneal bridge divided. After another short interval of rest the skin of the upper eyelid is held up between the finger and thumb, with which pressure is applied to the upper margin of the cornea, while with the index and middle finger of the other hand the lower eyelid is held aside and counter-pressure applied, so that the lens is made to glide through the opening. If cortical substance remain behind, friction through the lid upon the eyeball makes it advance, and, the eyelids having again been opened, it is easily squeezed out. As it is only in very rare cases that I give chloroform, I prefer the lower section, for without chloroform it is difficult to make the patient look downward for the removal of the lens, and still more so for the removal of the cortical substance, which is so very essential. When I do administer chloroform I prefer the upper section, though even then the dragging down of the eyeball with forceps cannot be done without risk to the vitreous humor, and in small, sunken eyes is impracticable. Indeed, in cases such as these, I am forced by necessity to resort to the lower section, and find it much safer than the method I generally practice in cases of old people. I find that finishing the corneal section without a speculum renders the manipulation more easy and comfortable for the patient, so that I dispense with the use of cocaine on account of its bleaching the parts; that sometimes the corneal margin cannot easily be seen, and as the use of this drug is not without risk, I prefer to do without it. As a rule, my patients do not complain of excessive pain, and I think that it is desirable in every case to test the sight before putting the patient to bed, as it puts him into a more cheerful mood than if he be left in uncertainty and the result taken on trust. The healing process is thus facilitated."

Wolfe's dressings consist of three strips of court-plaster applied to the closed eyelids, and two square pieces of lint and an immovable bandage. He dips his instruments in hot water and dries them with lint before the operation, and at subsequent dressings bathes the eyes with warm water alone; nothing of an antiseptic nature being used. He believes that the application of antiseptic dressings to the surgery was not a very happy thought, for, in the first place, we cannot exclude from the conjunctival sac the germs which float in the atmosphere, and, in the second place, we must first decide which is the true germicide.

For better optical purposes and greater ease in operative technique, Knapp[249, June] divides the capsule horizontally during the corneal section. He has employed this procedure in 64 cases. In hypermature cataract, with a thickened or tough capsule, he finds the plan more than ordinarily difficult. He considers the method contra-indicated when there is a narrow pupil and where the anterior chamber is shallow. In cases of simple extraction, Boucheron[274, Sept.] proposes not only to make the incision with the Graefe knife, but to use the point of the instrument as a cystitome and its back as an aid in the delivery of the lens.

Accacio da Gama[2, Nov.16] has operated successfully on 130 cases of cataract by the following method: On the day previous to the operation he dilates the pupil to its fullest extent with atropine. At the time of the operation the eye is anæsthetized with cocaine and the patient laid on the table. The eye is then washed with the corrosive-sublimate lotion. He says: "I separate the lids with the wire speculum, fix the globe at the lower part, and pierce the cornea with Graefe's knife at the outer margin, about one or two lines above the horizontal meridian, according to the size of the cornea at its upper margin. I now carry the point of the knife downward as far as the lower margin of the dilated pupil, and I pierce the capsule with it, and, lowering the handle of the knife toward me, I open the capsule vertically upward to a little above the line of the corneal puncture; then, drawing out the knife a little, I again pierce the capsule horizontally on a level with the corneal puncture and carry the point of the knife through, and, raising it a little, make the counter-puncture in the cornea exactly opposite the puncture and complete the section of cornea. I then press out the lens with the tortoise-shell spatula, instill atropine, and apply antiseptic compress and bandage. Formerly, the patient was taken to his bed on a stretcher; latterly, however, I make him wake up to it. After the first forty-eight hours I allow him to sit up if he feels uncomfortable in the sleeping position. The eye is opened and dressed once in twenty-four hours with the instillation of atropine each time. I do not use eserine, because I have found that the prolapse of the iris occurs more frequently under its use than under the use of atropine, and the reason seems to me to be this: that while the pupil is fully dilated with atropine, the striæ of the iris, being fully contracted, are not sufficiently lax to protrude through the corneal section. When, however, the pupil is contracted with eserine the striæ remain partially relaxed and the fresh secretion of the aqueous humor can easily force the iris through the wound, the power of the sphincter of the iris being insufficient to prevent its protrusion. In a very few cases there has appeared a small prolapse of the iris, or a piece of the capsule in the pupil. These inconveniences, however, do not interfere with good vision." He makes the remarkable statement that "the shortest time in which I have been able to perform this operation was twenty-five seconds, but fifty are ample." In conclusion, he remarks: "I do not operate by this method unless the pupil dilates to the fullest extent under atropine; and it should not be attempted where posterior synechia are present, because when the pupil is not well dilated they are apt to embarrass the delivery of the lens. No assistant is required to help perform this operation, and only one instrument is introduced within the eye, namely, the Graefe knife."

Knapp$^{59}_{\text{Mar. 30}}$ prefers Pamard's solution, and has ceased the use of solutions of bichloride of mercury. To prevent sudden movements of the globe, he takes the precaution to render the material lukewarm before instillation. If the pupil be dilated and the lens well convex, he opens the anterior capsule with the knife (preferably a narrow Graefe) in its passage through the anterior chamber; but, should the pupil be narrow and the iris become engaged, he withdraws and rapidly passes the knife through the anterior chamber when the iris has become sufficiently disengaged. He recommends the use of the upper section not only on account of its operative advantages, but also on account of the better chances which it gives of preventing collapse of the iris and escape of the vitreous. He avoids a downward position of the eye during the manipulations, so as to prevent gaping of the section, with prolapse of iris and vitreous. He also cautions the patient to keep the eyes up whilst bandaged, and not to attempt to look down. He takes great care to cleanse the pupillary area. He believes that complications of simple cataract extractions can be reduced almost entirely to accidents.

Gruening[59 Mar.30] does not favor the method of making a simultaneous section of the cornea and capsule, as it changes a very simple section or operation into a very complicated or difficult one; neither does he dread the cystitome, as it is his custom to boil all of his instruments before use. He advocates the simple operation, having performed it successfully "a good many times." Webster[59 Mar.30] employs the simple method save in unavoidable exceptions. He always uses the speculum and applies the fixation-forceps to the lower margin of the cornea. He prefers the "Veis knife," with which the danger of the iris falling before the instrument is reduced to a minimum. Although using Pamard's fluid, he is not sure but that sterilized water is as good. Cocaine (4 per cent. and 2 per cent.) is employed, so as to dilate the pupil one-half. He takes care to obtain a conjunctival flap. Bull[59 Mar.30] has nothing but a favorable account to give of simple extractions without iridectomy. He makes use of a knife much narrower than the original narrow one of Graefe. He keeps his incisions entirely in the cornea, and always endeavors to perform capsulotomy at the same time. He is extremely careful to remove all lens-matter, even though it be necessary to irrigate the anterior chamber with boric-acid solution. He instills eserine after the operation, followed by dressing the eye, which, if no special reason be offered, he allows to remain bandaged three days. If synechiæ are present he uses weak solutions of atropine. St. John Roosa[59 Mar.30] also makes use of the simple method, believing that, in spite of the difficulties which attend it or any operation, it is the simplest that he has undertaken. In hopes of facilitating the movement of the lens, Valk[59, Mar. 30] has devised a pair of iris-retractors, by which the iris is held backward and downward as the lens is passed outward. He has employed these about twelve times with satisfaction, and claims that they have not produced any irritation of the iris. They are made about the size of an ordinary iris-forceps and have small smooth knobs situated at the ends of the blades. Ayres[347, May] reports the results obtained in a series of 32 cases of extraction of cataract without iridectomy. In 2 cases prolapse of the iris occurred and excision had to be performed. In 3 cases there were small cystoid cicatrices of the iris. In his hands he thinks that the report is certainly encouraging as showing a fair average of good results. "A consideration in favor of the operation is that any soft cortical substance remaining would cause less harm behind the iris than it would in a case where an iridectomy had been made, and where the swelling lens-substance could come directly in contact with the corneal incision."

In performing iridectomy in cataract extraction, Roberts[760, Nov. 16] dispenses with the iris-forceps, preferring to use an iridectomy hook. Although employing thorough cleansing, boric acid, or corrosive sublimate, he is of the opinion that in eye surgery neither antisepsis nor anæsthesia is absolutely called for. As the results of 45 cases of operation, Bourgeois[274, Sept.] has found the best results to follow careful antisepsis of everything connected with the procedure, taking care to make a large corneal flap, and to remove a large piece or all of the "cristalloide antérieure" by the aid of a special forceps, as well as to practice almost exclusively the simple method of extraction.

According to Landolt (corresponding editor in Paris), de Wecker considers the future steps of the operation for the extraction of cataract to consist in the following procedures: The non-transparent portion of the cornea indicates the limit for sections, as migratory ophthalmia will then be avoided by carefully shunning any encroachment upon the trabecular tissue of the cornea. Iridectomy should not be performed except in case of danger. In cystotomy capsular tearing is preferable to the simple opening. True progress in the extraction of cataract will consist in gradually reducing the number of the combined variety of extraction by various improvements. In the attempt to perform an iridectomy on a patient aged 69 years, with Morgagnian cataract of twenty years' duration, Barrett[285 Dec.15] encountered escape of aqueous, breakage of capsule, and extrusion of soft cortical at the time of an incision with the "sclerotome" at the upper margin of the cornea, followed by difficulty in securing a coloboma in a rotten iris. Finding that the cortical portion of the lens had been lost, the corneal wound was enlarged in each direction with blunt scissors, and a cystitome introduced for the further laceration of the capsule, when the fluid vitreous began to pour out and the nucleus dislocated backward. The second of two attempts to remove the nucleus proved successful, although probably two-thirds of the vitreous were lost and the sclerotic and cornea became collapsed. A subacute iritis set in about the fourth day, but ultimately the eye recovered, with slight conjunctival irritation remaining, the fundus not being visible on account of opacities in the vitreous. Vision with spherical + S. 4. D. equaled $\frac{1}{7}$. The fellow-eye, which contained immature cataract, was extremely myopic with fluid vitreous.

In 2 cases[60 Feb.9] of *spontaneous dislocation of the lens* into the anterior chamber, Keyser ingeniously accomplished fixation of the dislocated lenses by transfixing them with a curved needle whilst the patient's head was bent forward, he placing himself in a prone position during the time that he was securing them *in situ*. Chiralt, of Seville, Spain, corresponding editor, sends us an instance of luxation of the lens into the anterior chamber, occurring in the practice of Gastaldo,[508 Feb.10] in which irritation symptoms were produced. Treatment consisted in extraction, which resulted in cessation of all bad symptoms. A case of spontaneous dislocation of both crystalline lenses into the anterior chambers, occurring in myopic eyes, is reported by de Schweinitz.[112 Nov.] The right eye, which was entirely blind and painful, was enucleated, whilst from the left anterior chamber a partially-degenerate lens was successfully removed. With the exception of an aggravated spasmodic entropion, necessitating operative interference, rapid healing took place, leaving a vision of $\frac{10}{100}$, without the necessity of any correcting lens. Despagnet[173 June] has successfully removed a luxated lens from the posterior chamber of an eye by first performing a downward iridectomy, followed two months later by extraction with the aid of a curette; a small amount of vitreous being lost. In eighteen days vision equaled two-thirds of normal.

In a case of traumatic cataract complicated with occlusion of the pupil by masses of exudate lymph and a "coloboma of the iris," Wuerdemann[347 June] has obtained a vision $^{5}/_{L}$ by performing discission of the lens and making a button-hole pupil in the false membrane.

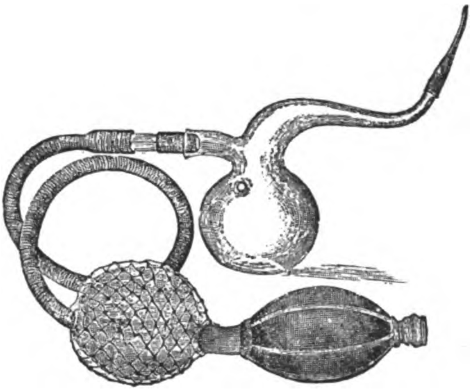
The notes of 6 cases of successful extraction of luxated lenses by the assistance of the Agnew bident are given by Pomeroy.[138 May] In the use of the instrument, he cautions against pressing the lens too far into the anterior chamber, as in performing the after-section for the extraction of the lens; the iris and the lens are thus rendered more liable to be cut through, or the section itself may be forced to insufficient size. Pomeroy[1 Nov.16] has decided that it is better to operate without a speculum or forceps, preferring to use either a lid-elevator or the fingers.

According to Maklakoff, of Moscow, Russia, corresponding editor, Rouprianoff[653 No.2] gives a very interesting description of the method of extraction of a complicated cataract.

In an analysis of 120 cases of cataract extraction, Thomas[776 Jan.] ascribes the marked improvement in results after the first 50 cases not only to increasing experience, with consequent greater skill, but to the abandonment of the sclerotic incision for the low corneal flap, to the frequent employment of preliminary iridectomy, and, lastly, "perhaps most of all, to the adoption of the peripheric division of the capsule."

Chiralt, of Seville, Spain, corresponding editor, calls attention to a case of congenital double cataract of the zonular variety successfully operated upon at 9 years by a double iridectomy.[785] The Bribosias (father and son)[171 Jan.] do not operate if the other eye is still good, and then only on ripe cataracts. They accomplish maturation by repeated punctures of the anterior chambers. Preparation of the eye is made by the application of compresses of 1 to 1000 to 1 to 2000 sublimate solution for several days previously. They employ cocaine and chloroform only for children. Before operation the knife is rapidly passed across the flame of a spirit-lamp. The section of the cornea is made in one-third of the circumference. For the prevention of the incarceration of the iris and to render the coaptation of the corneal section more perfect, to prevent infection from conjunctival secretion, as well as to lessen the irritation from prolonged closure of the lids, and to allow the use of atropine in a couple of hours after operation, Suarez de Mendoza[173 Sept.] proposes suture of the cornea. Gayet, according to Landolt, also speaks in favor of this procedure.

Buller[282 July] is inclined to attribute the unusually successful results obtained in his last series of cataract extraction (90 cases with 76 good results, or 84.4 per cent.; 12 satisfactory results, or 13.3 per cent.; 2 unsatisfactory results, or 2.2 per cent., and no failures) "to the strict use of antiseptic precautions rather than to increased skill in operating, or any other collateral circumstance." Critchett,[2 Aug.94] after considering the various methods of treating immature cataract, concludes that "it is probable that the best solution of the problem will ultimately be found in a happy union of Förster's somewhat radical method, with the eminently conservative plan which is advocated by Tweedy." Based upon experimental studies, Nuel[274 Sept.] gives decided preference to the so-called "physiological solution" of chloride of sodium, whilst Panas[274 Sept.] thinks that boric-acid solution offers the same antiseptic qualities as mercuric salts. Both Gayet and Wicherkiewicz are content with boiled water. Chibret wisely says that if we do not infect the anterior chamber it is useless to disinfect it. He believes that mechanical irritation enters into the question.


THE UNDINE IRRIGATOR.
(*Revue Générale d'Ophthalmologie.*)

Wicherkiewicz[78 Mar.] is of the opinion that washing of the anterior chamber is of value as an antiseptic in operations upon both healthy and diseased eyes for the relief of hypæmia or hypopion, and for the expulsion of crystalline *débris* immediately following cataract extraction. The accompanying cut gives a very good idea of the apparatus that he employs. The injection which he uses is one that simulates as nearly as possible the aqueous humor; this he obtains by adding a very weak percentage of salt to distilled water which has been sterilized by boiling and freezing.

Mugniéry[211, Mar. 3] is an advocate of intra-ocular lavage during the extraction of cataract. He prefers that the instrument be kept from the anterior chamber. It frees the eye from pus and blood formation, gets rid of cortical remnants, fixes the iris in better position, and renders the wound-flap more accurately placed without the introduction of instruments into the organ; besides, it acts as a disinfectant. He avoids the use of atropine. To him, increased tension and escape of vitreous are the only bad symptoms (?). In irrigation of the anterior chamber for the removal of *débris* after cataract extraction, Lippincott[9, July 27] has been able to avoid unsteadiness of ejecting force and liability of entrance of air-bubbles by an apparatus so arranged that it can be easily managed and its movements controlled by one hand.

A series of 21 cataract operations, in which intra-capsular irrigation was employed to dislodge soft cortical substance which a judicious amount of pressure failed to remove, is reported by Lee.[2, Mar. 30] The results obtained in those cases in which vision had equaled counting the fingers immediately before the operation leads the author to recommend this method in preference to that of extraction with capsule in similar cases. An iridectomy is considered almost an essential precursor to irrigation.

Webster[138, Feb.] instances 3 cases in which loss of the eye followed needling for soft cataract. The first 2 were in children whilst the third occurred in a man of 36 years. It is interesting to note that in this case sympathetic irritation caused spasm of accommodation in the well eye, and, with the increase of apparent myopia, a change in the axis of the astigmatism.

According to Maklakoff, Lawrentieff[725, May, June] gives a complete analysis of his third hundred cataract extractions. Katzaouroff[725, July, Oct.] advises the abandonment of suction in certain cases of soft cataract on account of the dangers of the operation. Landolt, corresponding editor in Paris, is in favor of discission for the congenital form of cataract. According to Maklakoff, corresponding editor in Moscow, Russia, Serebrennikowa[725, Jan., Feb.] gives the results of 200 operations for cataract performed in the Municipal Hospital of Perme. He says that it is interesting to know that her first hundred were executed in eighteen months, whilst her second hundred were done in seven and a half months.

Barrett[285, Oct.] gives an instance of intra-ocular hæmorrhage occurring four hours after extraction of a traumatic cataract of six weeks' duration. At the time of the operation a portion of the lens-matter was in the anterior chamber and tension equaled plus two. Two weeks later the eye was removed. The author attributes the hæmorrhage to sudden reduction of support to the choroidal vessels, and "thinks that it would be advisable to apply a very firm bandage to cases of extraction where there is any glaucomatous tendency."

A hook for the removal of lens-capsule remaining after cataract extraction has been so modified by Bronner[2, Sept. 28] as to admit of more ready withdrawal from the corneal wound. The advantages claimed for it are that it is more easily made aseptic, that the wound required for its introduction is much smaller, and that in cases of tough capsule the membrane can be more readily seized.

Norton[776, July] extols the value of the ice-bag for aborting or checking inflammation in its incipiency after cataract extraction. He adds that after suppuration of the cornea has begun it is of no service and may do positive harm. He also attaches importance to the internal administration of rhus toxicodendron, and gives proper weight to thorough antisepsis.

Romiée[171, Jan.] relates several cases of panophthalmitis consecutive to extraction of cataract. Several of the cases presented "plaques" of choroiditis and choroidal atrophy. The author admits that the traumatism was the exciting cause. In one instance the condition appeared eight days after the operation following an acute attack of articular rheumatism. Antisepsis was resorted to, but no note is made as to its nature.

Chisolm[101, Jan.] has further modified the after-treatment of cataract extraction. He no longer applies a dressing to the sound eye, being satisfied that the procedure is absolutely useless. He allows as much light to enter the room as the eye will comfortably bear, at the same time placing no annoying restrictions upon bodily exercise.

Steffan[204, Jan.] believes that it is impossible to prevent the access of bacilli to the corneal wound. He therefore logically emphasizes the importance of a perfect technique to achieve what he, at least, calls indirect antisepsis. By this term he means the establishment of a wound which will offer the strongest resistance against the lodgment of pyogenic micro-organisms and the least favorable soil for their future propagation. He thinks that the von Graefe method of linear extraction and the old high corneal flap cannot withstand this test. The latter, owing to its great height compared with the extent of its base, is poorly nourished, and, therefore, having a lower vitality, offers less resistance to microbes. Further, as this opening is too small for the delivery of most mature cataracts, the wound is more or less crushed, thus permitting of more ready contamination than a clearly-incised wound with a smooth surface. The latter fault, as well as the immediate traumatism so near the ciliary region, also applies to the von Graefe method. The author therefore recommends a corneal incision which gives a flap of broad base and little height, which is sufficiently large to permit an average-sized cataract to escape with ease. He obtains this by making a flap the base of which is 2 millimetres ($\frac{1}{12}$ inch) distant from the horizontal diameter of the cornea, the puncture and the counter-puncture being made at the corneo-scleral junction; this being done so that the incision falls just in the border of the transparent cornea, in order to avoid troublesome hæmorrhage from the conjunctiva at the limbus corneæ. He favors preliminary iridectomy as causing a decided decrease in the number of affected cases. The Becker method of horizontal incision of the anterior capsule is preferred for reasons given by this author. He opposes Pagenstecher's plan of extracting the lens in its capsule, as he deems the risk of infection greatly increased by exposure of such an excellent culture medium to direct contamination as the vitreous, besides unnecessarily enlarging the extent of the field of traumatism. By his method he claims but 2 per cent. of loss by infection.

In an article upon needless and annoying restraints in eye surgery, Chisolm [347 Aug.] says that, whilst cleanliness holds first place, overzeal in antiseptics should be carefully avoided. He never makes confinement to bed compulsory, and always allows the patient to enjoy any degree of light which is not offensive to the eye. He has abandoned the use of the eye-bandage after iridectomies and cataract extractions, in which cases he employs pieces of isinglass-plaster, and, lastly, most pertinently says that "another annoying and injurious restraint is rigid diet enforced after eye operations."

Based upon careful macroscopical and microscopical studies, showing the arrangement of the endothelium related to the newly-formed hyaline substance found in secondary and capsular cataracts with their relation to the surrounding structures, Wagenmann[204 Ap.] concludes that this material takes its origin in the endothelium of the capsule, which he assumes to have the property of the formation and secretion of this hyaline substance. He has been able to find transitional stages in this development. Schirmer[204 Ap.] has also made a careful and extensive series of experiments bearing upon the same subject. His results, which are similar to Wagenmann's, are more precise and comprise a much wider field. The latter author sums his conclusions into the belief that both capsular cataract and scar arise from the epithelium of the anterior capsule. He further thinks that the pigment found in the capsular scar arises from the iris, and that the delicate hyaline lamellæ found under older cataracts is secreted from an epithelial covering between the new material and the lens proper. He believes that capsular shrinkage occurs so as to compensate for the overelaboration of capsular substance, and, lastly, from all of his researches, he is led to assert that it is in the highest degree probable that the capsule itself is a product of the ectoderm.

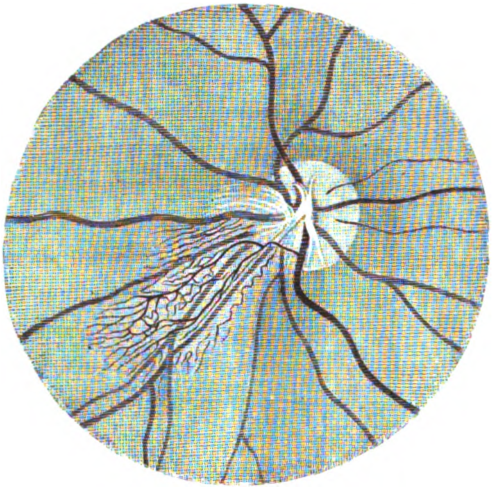
Starting with the proposition that inflammation is synonymous with infection, de Wecker[171 Mar.] thinks that the general diatheses and so-called endogenic infection are merely secondary in the production of traumatic inflammations of the eye, and says that the principal rôle is nearly always played by an ectogenic infection, which is either immediate, *i.e.*, by the direct introduction of germs during operative interference, or mediate, where the germs have gained access to the interior of the organ by improperly-healed openings.

In a short though important article upon the structure and treatment of certain forms of secondary cataract, Rogman[171 Ja.] divides the condition into two varieties, the first of which has adhesions existing between the posterior surface of the iris and the anterior face of the capsule, whilst in the second type the iris is normal and free.

Eales[6 Dec.30] has operated on the right eye of a man, 62 years of age, who had been affected with double congenital cataract. After the operation the patient was found to have excellent perception for colors and large objects, while the perimeter showed a full field for white. Central vision, however, was very imperfect, equaling but $\frac{6}{270}$. The temporal half of the disk was pale and atrophic, similar to that so frequently noticed in tobacco amblyopia.

DISEASES OF THE VITREOUS.

Hotz[347 Sept.] gives the histories of 3 cases of magnet *extraction of iron fragments* in the vitreous, and rightly says that "the presence of iron in the vitreous alone is not a sufficient indication for this operation; besides being convinced the foreign body is in the vitreous, we must also have good reason to believe that after the removal of the iron the eye will recover, if not any vision, at least such a good condition that its preservation is an object to the patient, and that it will not become a source of danger to the other eye. Consequently, I cannot consider the operation applicable to cases where the eye has been so extensively wounded that, foreign body or no foreign body, the lesion itself will necessarily cause complete atrophy of the eyeball; nor is it applicable to eyes in which the irido-choroiditis, incited by the foreign body, is so far advanced that the unavoidable result will be an irritable and dangerous stump, even if the magnet operation be successful. Trompetter[353 Mar.] gives another instance of the successful removal of a piece of steel from the vitreous by means of the electro-magnet. To facilitate the removal of the fragment he made an incision into the sclerotic at right angles to the original wound. Upon the twentieth day choroiditis developed, but soon disappeared under the use of pilocarpine, given hypodermatically. He does not consider the chances of retinal detachment to have ceased until all traces of vitreous opacities have disappeared. McKeown[2 Feb.], reports 2 cases of foreign bodies in the vitreous. In the first, extraction



NEW BLOOD-VESSEL FORMATION IN THE VITREOUS.
(HIRSCHBERG.)
(*Centralblatt f. praktische Augenheilkunde.*)

was effected by an electro-magnet through a sclerotic incision. In the second case the body had remained in the vitreous for a month without exciting inflammatory symptoms, and it was deemed best not to attempt its removal.

Hirschberg[190 Jan.] gives the instance of a case of *new blood-vessel formation* in the vitreous, situated in front of the entrance of the optic nerve. He considers it as most probably of specific origin. The accompanying figure illustrates the condition seen.

George C. Harlan[1034] gives an excellent phototype of a case of extensive *vascular growth* in the vitreous. The right eye presented a very peculiar ophthalmoscopic appearance. The fundus was slightly hazy, but could be seen pretty distinctly, as if through a thin veil, by accurate focusing. There were several dull, yellowish-white spots about the macula, the remains of old hæmorrhages, but no recent extravasations. The vitreous was quite transparent and free from shreds. The disk was obscured by congeries of contorted vessels. By following these forward with convex lenses a beautiful vascular net-work could be seen, forming a delicate, veil-like membrane, stretching forward and outward at an angle of about 45 degrees. Its anterior margin, which was extremely delicate but sharply defined, and was formed by anastomosing capillaries, could be seen with + S 4 D. The vessels which, by rapid subdivision and inosculation, formed this net-work came directly from the disk and seemed to have no connection with the retinal vessels, these latter being readily seen through the veil in their normal position. There was nothing like a stroma—not even an opacity; nothing but vessels which offered but little obstruction to a view of the parts beneath them. In the left eye there were also inosculating vessels stretching forward into the vitreous from the disk, but not nearly so numerous as in the right.

DISEASES OF THE CHOROID.

Coggin[347 Mar., Apr.] has seen 2 cases of *rupture* of the choroid, both the result of traumatism, the one showing an inverted Y-like tear to the temple side of the disk, and the other a semi-lunar break concentric with the outer edge of the nerve, about one disk's diameter from the temporal border.

Doyne[1088 v.9] reports an instance of a patient who six weeks previously had received a blow on the right eye from a block of wood. "Central vision is lost, but he seems to have good peripheral vision; R. V. = $\frac{6}{60}$. In the fundus can be seen an extensive choroidal hæmorrhage which is clearing, leaving patches of atrophy. Ten years before this accident he had been struck in the left eye with a stick, which accident had also been followed by temporary loss of central vision. In both eyes, in all directions throughout the choroid, especially around the disks, irregular, jagged lines, nearly all deeply pigmented, could be plainly seen." He thinks that they were probably due to the rupture of the pigment layer of the retina. Six months later the choroidal hæmorrhages had disappeared, but the other conditions remained the same. Vision in this eye had improved.

Schiess-Gemuseus[204, Dec., '88] reports a case of traumatic *chorio-retinitis* of seven months' standing in which the fellow-eye became similarly affected. The treatment at first for the injured eye consisted in local blood-letting and purging, which caused temporary improvement. At the time of the involvement of the other eye, sweat-baths, new environment, and hydropathy were advised. In eighteen months from the time of the accident the sympathizing eye presented a typical and similar form of chorio-retinitis. The progress of the affection was arrested by the enucleation of the offending organ.

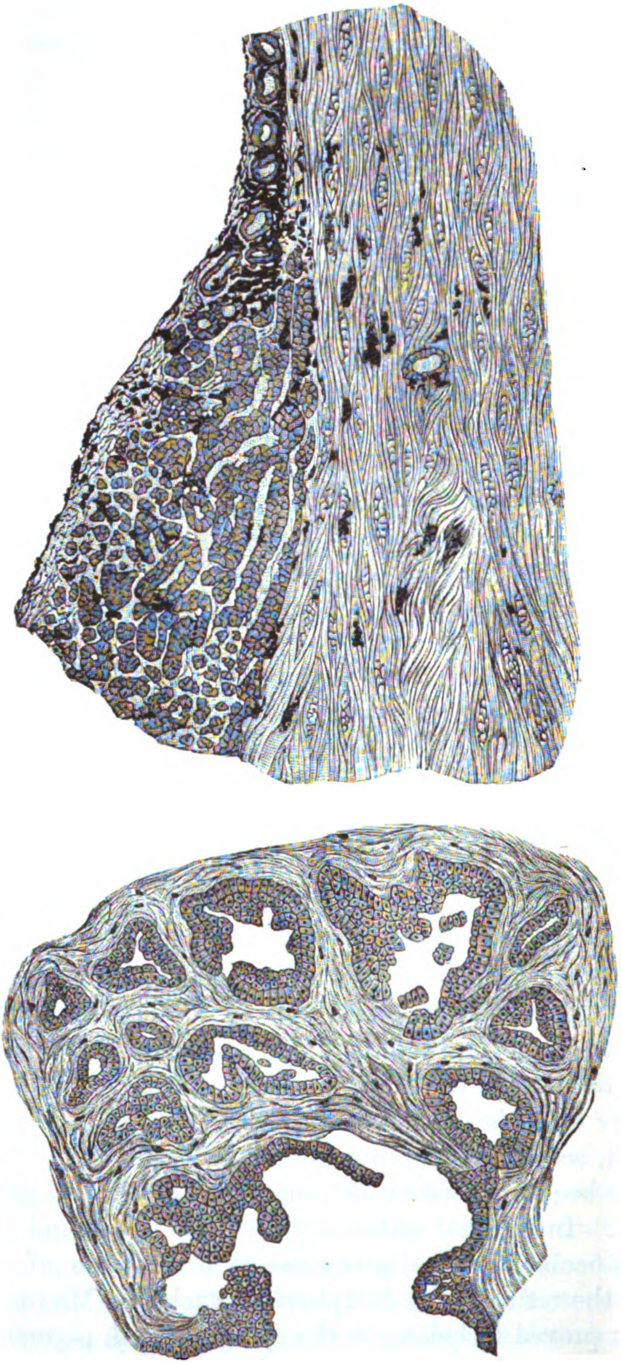
In Hutchinson's most interesting groupings of choroiditis,[6, Feb.] we find, in addition to those dependent upon dyscrasia and refractive errors, a type known as the senile central (as shown by Hirschberg's sketch). He also speaks of a choroiditis secondary to inflammation of the anterior portion of the uveal tract, and the traumatic forms which he says are progressive.

Campbell[776, Jan.] reports a case of *ossification* of a degenerate choroid in an atrophied globe, causing sympathetic irritation fifty-three years after the original injury. L. Grossmann[274, Mar.] believes that intra-ocular ossification takes its origin in the interstitial tissue of the "chorio-capillaire," and that it never arises in the cornea, sclerotic, vitreous, retina, or crystalline lens. Brockman[2, Mar. 16] reports a case of ossification of the choroid. A preceding syphilitic irido-choroiditis appears to have been the immediate cause of the condition. Burnett[61, June 29] reports a case of *sarcoma* of the choroid in a man 60 years of age. When first seen, there was a complete detachment of the retina, with about normal tension. Two months later severe cyclitis with pressure symptoms occurred, necessitating the enucleation of the eye. Microscopically, the growth had the appearance of a melanotic sarcoma.

Groenouw's 2 cases[254, Jan.] of *choroidal detachment* (simulating a choroidal tumor) following cataract extraction, and which resulted in spontaneous cure, is, according to the author, of importance, as illustrating the importance of differentiation between the two conditions as regards prognosis and treatment.

A case of *glandular tumor* of the choroid in which there were similar growths in the stomach and liver is reported by Gayet.[6, Jan.] The accompanying engravings represent sections of the choroid obtained in this case. The specimen was taken from an eye which had been enucleated from a young and vigorous peasant. It will be seen that the tissue is composed of epithelial and epithelioidal cells, which are infiltrated throughout the normal choroidal tissue, this tissue seeming to have a particular tendency toward the tubular variety. The glandular tubes themselves, as can be seen in the second cut, are composed of rows of cylindrical epithelium.

Buffun[776, Jan.] reports a case of *pigmented sarcoma of the choroid*, with recurrence in the orbital tissues, which was followed by death: this in spite of enucleation during an advanced stage of intra-ocular infiltration, and subsequent thorough exenteration and the application of zinc-paste to the walls of the orbit. A case of sarcoma of the choroid in a woman of 66 years and a granuloma in a 13-year-old girl have been observed by the same author.[776, Jan.] A melanotic sarcoma of the eye, in a woman 50 years of age, has been enucleated by Bennett.[6, Sept.21] The entire mass was removed. Microscopic examination showed the new tissue in many parts to be alveolar sarcoma. The case is of interest on account of the slow growth of the tumor, the disease having been detected as intra-ocular more than eight years previously. Two cases of sarcoma of the choroid, both occurring in women, aged respectively 30 and 40 years, have been reported by Benson.[16, May 1] The affected globes were enucleated. In the first instance the tumor was found to be entirely intra-ocular, and had given rise to a condition of secondary glaucoma, the retina being completely detached. Microscopically, the growth proved to belong to the spindle-celled, pigmented variety. In the second case the growth incompletely filled the globe,



ADENOMA OF THE CHOROID.
(Archives d' Ophtalmologie.)

having extended along the perforating vessels and through the optic nerve, so as to form a large orbital tumor. The microscope showed the neoplasm to be a loosely-bound, round-celled, and very deeply-pigmented sarcoma.

DISEASES OF THE RETINA.

In an analysis of 47 cases of death of newborn infants, Naumow[21, Nov.] has found retinal œdema, retinal hæmorrhages in the muscular region, choroidal hæmorrhage, and beginning choked disk in 12 instances. Amongst the immature these changes were not found, but were most prevalent amongst the mature, who suffered difficult and instrumental delivery. From these facts he is led to believe that probably congenital amblyopia has its origin in these changes, which are brought about by stasis in the vessels of the head.

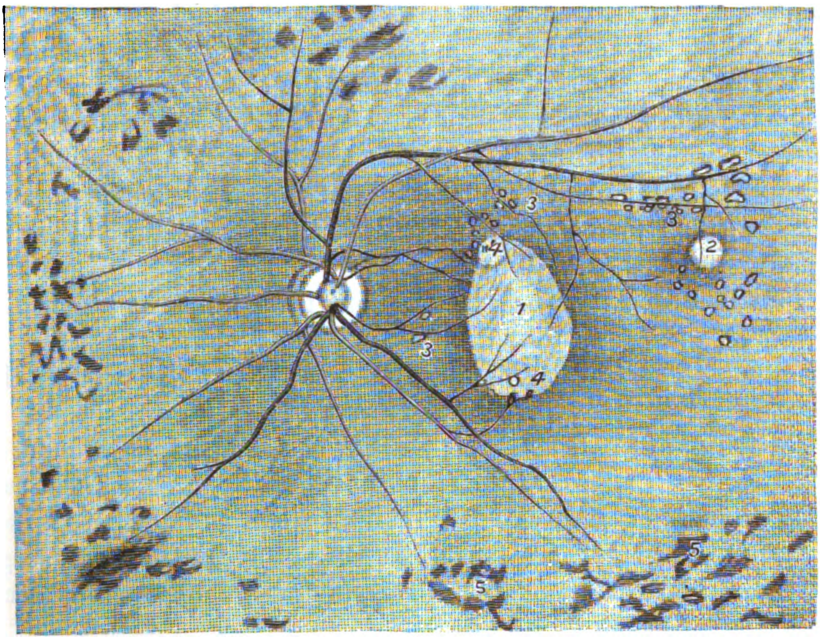
Hirschberg[190, Feb.] reports a case of *pigmentary degeneration* of the retina, with consequent "night-blindness." In the periphery of the retina in front of the equator the well-known pigment net-work appeared, but throughout the entire region bounded by this net-work there were numerous white "pimples," containing one or more pigment-points. He believes that this part of the fundus represents that portion of the visual field which has good vision in daylight, and says that this brings forward the suggestion of the rôle of the visual purple and its origin in the pigment-cells.

Microscopic examination of sections of the optic-nerve entrance from a case of *retinitis pigmentosa*, in which the eye had been removed for "glaucoma absolutum" in a girl of 16 years, has been made by Reid.[213, June] The interesting feature was the presence of amyloid bodies in the inner extremity of the optic nerve, replacing the nerve-tissue.

Alt[347, Dec., '88] gives the notes of 3 cases of *retinal detachment* occurring in three successive generations of the same family, the line of descent being mother, son, and daughter. Fischer[358, Mar.] recommends the intra-muscular injection of the soluble mercuric salts in the ambulatory treatment of retinal detachment, as well as in syphilitic affections of the uveal tract. Gelpke[190, Sept.] has met with disastrous results in the performance of Schoeler's method of injection of tincture of iodine in retinal detachment. The patient was a healthy man of 66 years. With the utmost precaution and careful antisepsis, 3 drops were injected, which was followed two days later by an infectious purulent choroiditis. In six days the patient died of meningitis. Galezowski[274, Sept.] asserts that good results may be obtained by passing a thread of catgut beneath the detached portion of the membrane.

In an extensive detachment of the retina, involving the outer portion and extending beyond the macula lutea toward the optic nerve, in which the fovea centralis appeared as a dark-red spot. D'Oench[59, Mar. 9] noticed numerous small white dots scattered throughout the detached portion, but most pronounced near the periphery, each spot being apparently of the size of a pin-head or less. In the absence of any microscopical examination, he says he can only conjecture that these dots are the result of some acute degenerative process. Examination of the urine failed to show any abnormality. This is followed by two observations by Valk,[59, May 25] in which ophthalmoscopic examination showed numerous white, glistening spots suspended at various depths in all parts of the vitreous. Some of the opacities seemed to be held in place by numerous dark filaments that were lost in the substance of the vitreous. When brought into focus the bodies appeared intensely white, surrounded by a dark circle. The author supposes these cases to be similar to the one reported by D'Oench, believing that the dots seen in the latter case "were scattered in the vitreous body, and not situated in the detached portion of the retina," which supposition is controverted by D'Oench[59, June 15] in the assertion that they were, beyond doubt, in the retina. Hotz[347, Dec., '88] adds an additional case of spontaneous cure of retinal detachment to those reported by Schweigger. Hotz's instance was that of a man, 74 years old, in whom the condition came on in the right eye two months before examination. When seen by the writer, there were all the characteristics of retinal detachment in a near-sighted eye. The fellow-eye, which had become cataractous, showed no contra-indication to a favorable prognosis for operation, except the patient's statement that "he never could see much with this eye." The cataract was successfully removed with good results. Examination of the right eye at this time showed that the retina had become re-attached, which persisted without recurrence at the time of a second examination, more than a year later.

Hirschberg[190, Sept.] supplements his previous studies upon senile degeneration of the middle of the retina by stating that in the healthy, where accurate vision gradually lessens so that the subject is almost unable to use his eye for proper centric vision, the following ophthalmoscopic signs, as shown in the adjoining sketch, will be found: 1. Rose-colored spots, as shown by the number 1. 2. Fresh white foci, as seen at 2. 3. Small, grayish-blue areas along and behind the vessels, as shown at 3. 4. Whitish spots containing crystalline bodies, as shown at 4. 5. Pigment-splotching in the periphery, as shown by 5.



Senile Degeneration of the Retina.
(Centralblatt für praktische Augenheilkunde.)

Stölting[204, Dec.'98] has effected the removal of an encapsulated *cysticercus* from the living human eye. A very careful ophthalmoscopic examination was permissible by reason of a transparency of the media, there being but a very slight haze of the vitreous, with a few fine threads in proximity to the parasite. The entozoon appeared as a cyst, 8 by 5 millimetres ($\frac{1}{3}$ by $\frac{1}{5}$ inch) in size, which was apparently divided by a deep depression, it being situated about 6 millimetres ($\frac{1}{4}$ inch) from the upper outer margin of the disk. It appeared yellowish in its lower half and dense white above. A small choroidal scar could be seen up and out from the cyst. Incision by means of a knife and scissors, as recommended by von Graefe and Leber, allowed traction to be made upon the growth by means of an iris-forceps. Examination by the microscope showed a cysticercus inclosed in the retinal layers, which were degenerate at this point. Recovery from the operative procedure quickly took place, but a retinal detachment soon made its appearance, causing blindness. No other gross sequelæ took place.

Hutchinson, Jr.,[2 May 11] mentions a case of *retino-choroiditis* in a healthy lad of 13 years. It was due to concussion of the eye from an explosion. In association, there was marked iridoplegia and a peculiar form of posterior polar cataract. The retina appeared pigmented in the region of the disk and the macula, whilst the periphery seemed normal. Optic-nerve atrophy came on, with reduction of central vision for form and decided limitation of the visual field. He asserts the possibility of increase of the pigmentation throughout the entire retinal area, and thinks it important to examine the eye-ground very early in all such cases.

A fatal case of *glioma* of the retina in an infant is reported by Ayres.[53 Feb.2]

Schiess-Gemuseus,[204 Dec.,'88] in an article entitled "Abscess in a Hyperplastic Retina simulating a Glioma," says, in the *résumé* of this peculiar case, as a casual remark based upon the ground of his own experience, that there is a possibility of a permanent cure after removal of glioma. The clinical picture of the case is very much like that of a glioma entering into the inflammatory stage. He gives an excellent picture of the condition, showing the intense yellow color of the apparent tumor.

Schoebl[190 Mar.] has given us a most interesting clinical picture and microscopic study of what he terms "*primary purulent retinitis.*" After saying that the majority of reported cases are metastatic in nature, more rarely accompanying panophthalmitis, or, still less frequently, the traumatic type, he asserts that in none of them is the inflammation limited to the retina. He reports 5 cases of primary retinitis, which he divides into "retinitis purulenta acuta traumatica" and "retinitis purulenta chronica." In the first figure, which represents a meridional section of the former type, it can be seen that there is also hyalitis, phakeitis, iritis, and interstitial keratitis, the vitreous being filled with young lymphoid cells, pronounced at the ora serrata. The optic nerve is markedly infiltrated with lymphoid cells and the nerve-head is deeply excavated, though the nerve-sheaths appear intact. The zonula is much lengthened, and the lens suffers forward displacement. He thinks that it is highly probable that the inflammatory process penetrated into the eye through the optic nerve and implicated the disk and retina, besides filling the vitreous with inflammatory products. He ascribes this type of symptoms as possibly due to a chronic circumscribed basilar inflammation, with downward propagation through the optic nerve.

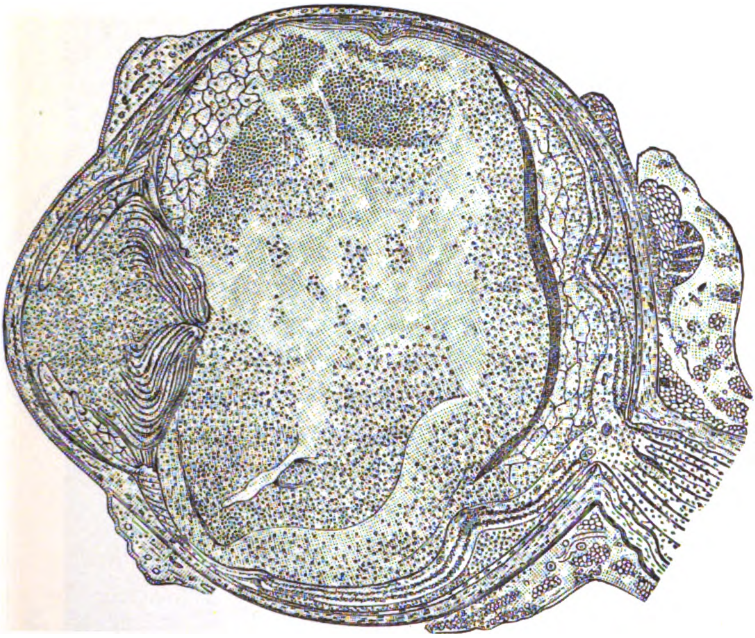


Fig. 1.—Retinitis Purulenta Acuta Traumatica, Hyalitis, Phakeitis, etc. (Meridional Section.)
(Centralblatt f. praktische Augenheilkunde.)

The principal changes are in the nerve-fibres, these being quite vascular and filled with granulation-tissue. From these vessels two columns begin, which run in opposite direction to join the cellular and fibrous layers on the external and internal surface of the retina. These conditions were found in 3 other cases, in each instance being produced by the irritation of small metallic splinters, which had penetrated the cornea and passed into the globe without wounding the uveal tract. He suggests that, should the uveal tract have been injured, there would have been a secondary retinitis only. The second wood-cut, which illustrates the second type, and which represents what was seen in the remaining 2 cases, is of interest. Here the uveal tract, although thin and atrophic, appears devoid of any inflammatory sign. The retina, however, is absolutely changed into a thick, purulent mass, this being the least.

Another case of *arteritis specifica retinæ* is given by Magnus.[353 Nov.] The ophthalmoscopic picture is shown in the colored plate, opposite page. A many-twigged vascular "tree," white in color, extends far out into the periphery of the fundus, where it is suddenly lost. The white trunk of the "tree" can easily be traced to its junction with the temporal artery at a distance of one and one-half disk diameters from the disk, the union of the white trunk with the normally-colored main stem being plainly visible. In two places there are club-shaped thickenings visible in the course of the white branches. In the trunk next to the nerve (inverted image) a fine red thread can be seen running in the direction of the vessel. The white "vessels" are closely sur-

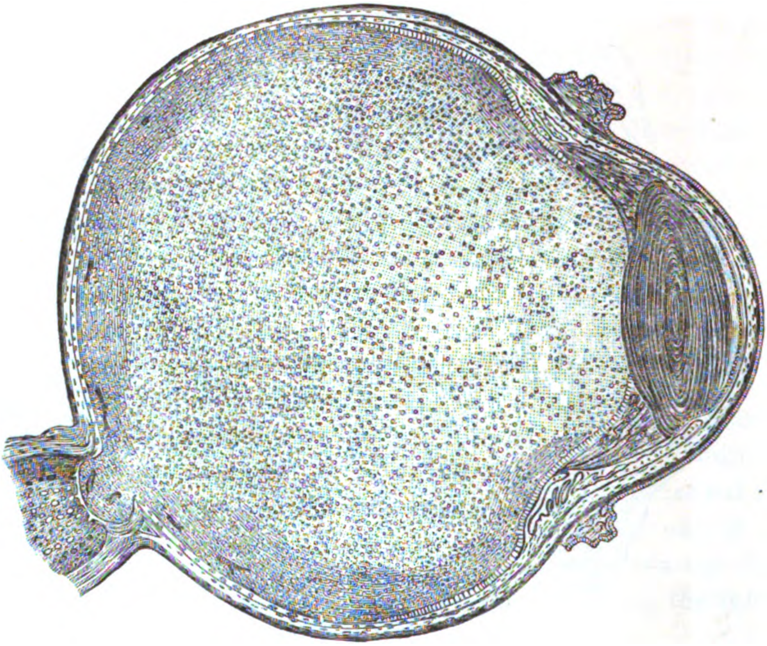


Fig. 2.—Retinitis Purulenta Chronica (Meridional Section).
(*Centralblatt f. praktische Augenheilkunde.*)

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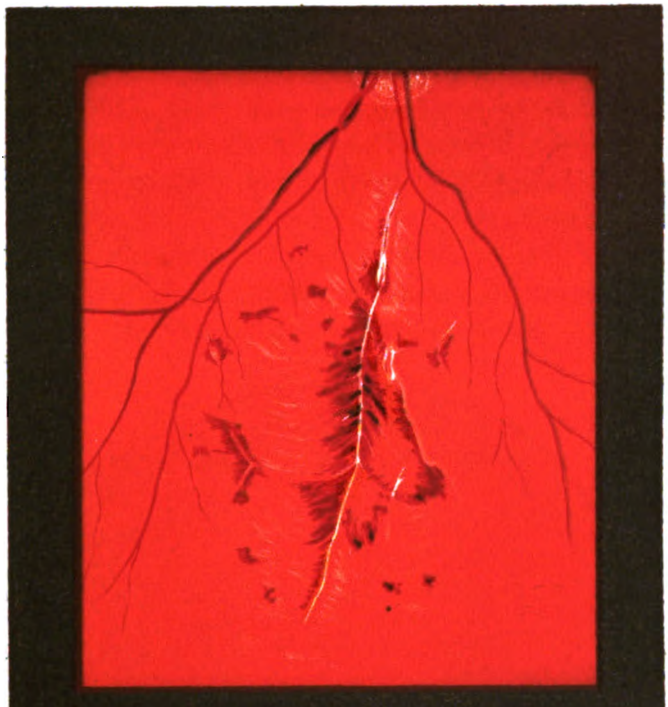

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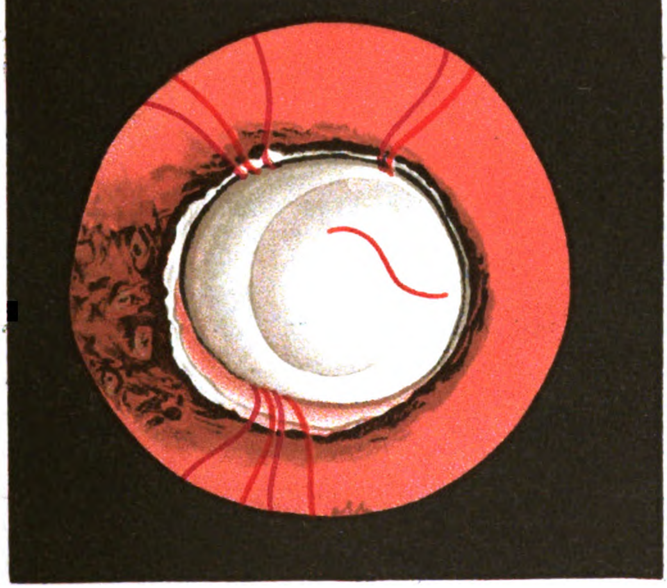
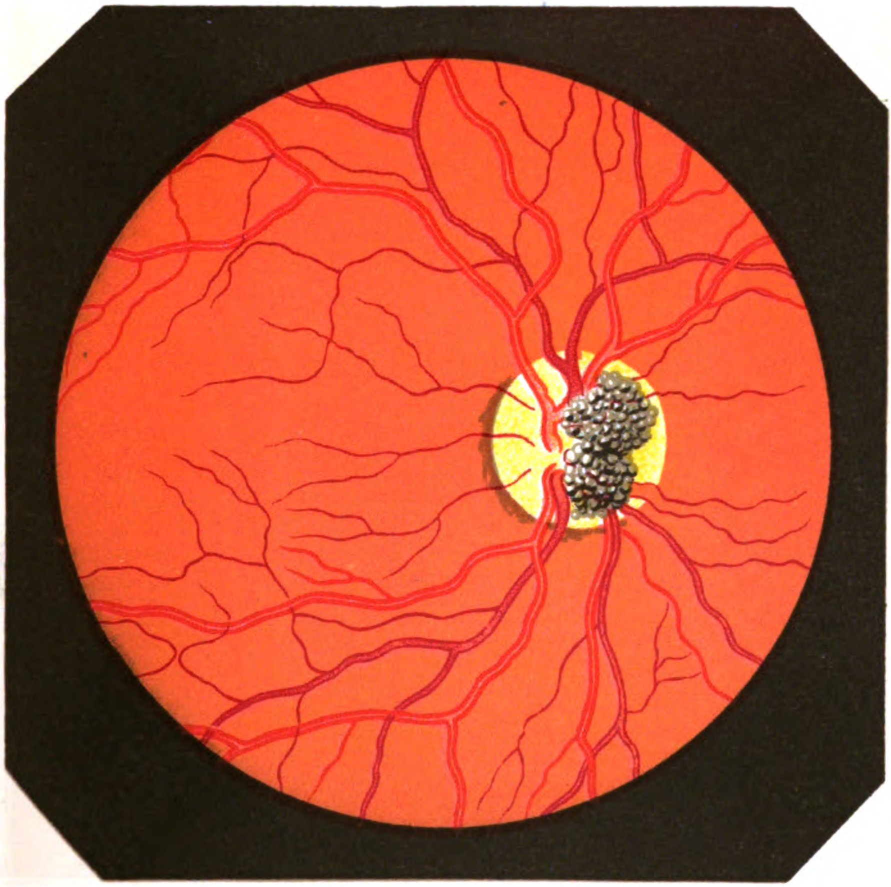


Fig. 1. Syphilitic Arteritis of the Retina.(Magnus.)
Fig. 2. Coloboma of the Optic Nerve.(Blessig.)
Klinische Monatsblätter für Augenheilkunde.

Burk & McFetridge, Lith. Phila.



Globular formations in and around the Optic Nerve. (Nieden.)
Archiv für Augenheilkunde.

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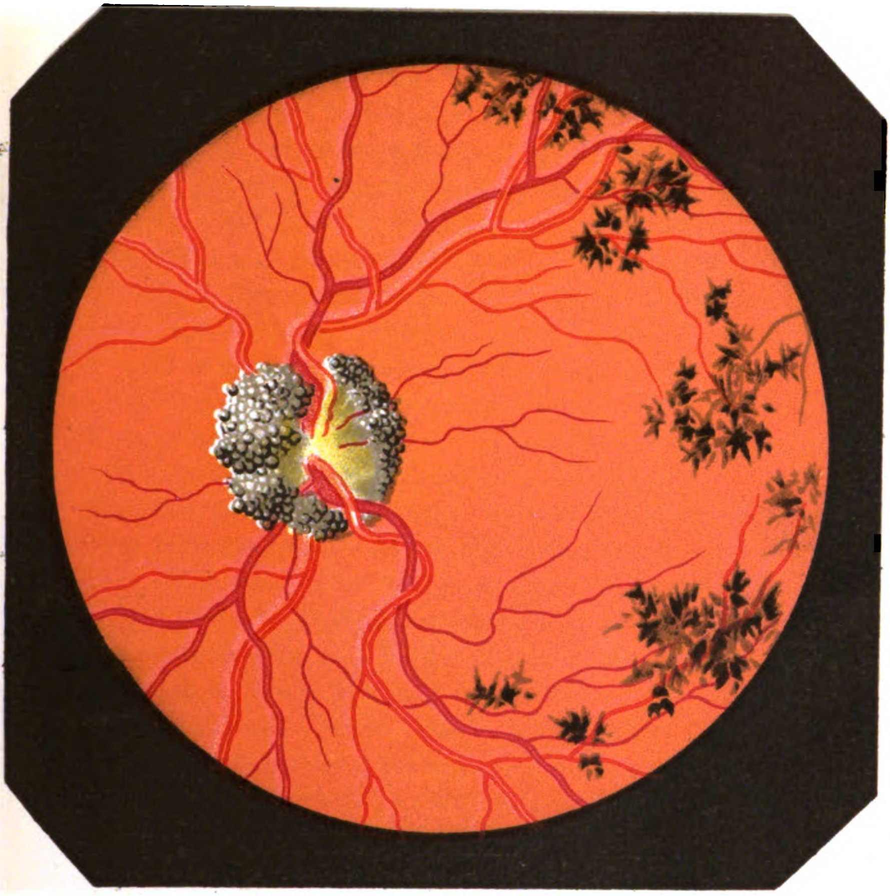


Globular formations in and around the Optic Nerve. (Nieden.)
Archiv für Augenheilkunde.

Burk & McFetridge Lith. Phila.

rounded by fresh hæmorrhages of striped appearance. In the neighborhood of the whole diseased vascular district the retina has a grayish appearance.

DISEASES OF THE OPTIC NERVE.

Schirmer[204, Dec.,'88] publishes the result of his anatomical studies upon a specimen taken from a case of *congenital optic atrophy*, the clinical history of which was published elsewhere.[190, Dec.,'88] The author compares the pathologico-anatomical results with the clinical observations. The most peculiar discrepancy existed between the functional disturbance ("complete amaurosis") and the organic lesion found ("slight gray degeneration of the optic nerve"). No inflammatory signs could be detected. He comes to the conclusion that the case cannot be considered a so-called congenital "retinal amaurosis," but must be numbered as one of the rare cases of congenital atrophy of the optic nerve. The article represents the first report of a post-mortem examination in such an instance.

We here present two interesting colored engravings of the grape-like excrescences found on the optic nerve, as noted by Nieden.[254, June] The smaller growth was under observation for eight years, and took its origin from the centre of the opticus. The other began at the periphery, and had been watched for ten years. In this case there was a history of slight traumatism to the cornea. The author refers to three similar observations, in two of which severe contusions of the skull were accompanied by loss of sight upon the same side, followed several months later by the peculiar papillary growths above noted. In all other cases the excrescences were bilateral. In regard to the pathogenesis the author indorses the theory of Müller and Leber.

In association with an interesting case of *sarcoma* of the left optic nerve, which had probably originated in the fibrous tissue surrounding the nerve-fibres, Sym[2, Sept.] offers us a most careful *résumé* of analogous instances; his case occurred in a female child of 3 years. Buffun[776, Jan.] reports a case of gliosarcoma of the optic nerve and retina in a 2-year-old child. Enucleation was practiced and the optic nerve severed close to the foramen. Microscopically, the extreme portion of the cut nerve was found infiltrated with cells. Recurrence in the orbit became apparent four and a half months later, the child dying from exhaustion in two months' time. The remaining eye, which had become blind six weeks before death, exhibited the characteristic yellowish-white reflex.

A *glioma* of the optic nerve, situated 8 millimetres ($\frac{1}{3}$ inch) behind the globe, measuring 1.5 centimetres ($\frac{3}{5}$ inch) in its widest part, and causing intense exophthalmus, has been removed from a 2-year-old child by Buffun.[776 Jan.] The tumor was irregular in shape and appeared as if developed from five foci along the nerve, and microscopically presented the characteristics of the white small-cell sarcoma.

From his own experience and that of others, as found in ophthalmic literature, Bull [1 Ap.27] feels justified in drawing the following conclusions: "1. In optic neuritis from whatever cause, and in papillitis or choked disk from intra-cranial tumors, galvanism, whether direct, through the closed lids and eyeball, or indirect, through the cervical sympathetic, has no real value and should be abandoned. 2. In optic neuritis due to heredity or a congenital tendency galvanization of the sympathetic nerve in the neck is of no value. 3. In simple, uncomplicated atrophy of the optic nerve the use of the constant current cannot be said to promise either positive improvement or an arrest of the degenerative process. In most of the cases in which an improvement of vision has been noted it proved to be merely temporary, and the same may be said of the apparent retardation of the degenerative process. 4. In cases of injury to the optic nerve galvanism has not proved of the slightest permanent value. 5. In traumatic anæsthesia of the optic nerve and retina, uncomplicated by any laceration of nerve-tissue or rupture of nerve-fibres, galvanism, carefully and persistently applied, has been known to produce a rapid and permanent improvement of vision when applied directly to the closed lids and the current passed through the eyeball."

GLAUCOMA.

In a critical and experimental study upon the pathogenesis of glaucoma, Picqué[274 Jan.] attempts to dislodge the pressure theory. He asks, "How is it that the macular fibres escape?" He believes that the organ is, in reality, diseased before the glaucomatous attacks appear, and asserts that the excavation of the disk is not caused by pressure, although, of course, increased tension deepens it. He thinks that glaucoma simplex is, in reality, a disease of the optic nerve, with secondary pressure symptoms, this view being strengthened by the inefficacy of iridectomy in the form of disease. He claims the chronic inflammatory type should be placed amongst the irido-choroidites. The acute variety alone he places in "glaucoma," and thinks that it is due to changes in the blood-vessel system. De Wecker, as quoted by Landolt, of Paris, corresponding editor, again contends for the theory of faulty excretion, as shown both in the clinical and the experimental exposition of glaucoma symptoms.

Rijnberk,[583, Feb. 23] of Amsterdam, Holland, corresponding editor, writes us that Straub gives further information in support of his theory of glaucoma described in last year's ANNUAL (vol. iv, B-113). He says that, "whereas in the normal eye the eye-lymph is chiefly secreted in front of the septum, in the eyes in which this venal congestion takes place the vessels situated behind the septum become prominent. The lymph, which is discharged in this way into the space of the vitreous fluid, must find an exit along the papillæ nervi optici and the zonular fissures. Much will not be evacuated in this manner, so that the space of the vitreous fluid will be enlarged, which will lead to a removal to the front of the intra-ocular septum and excavation of the papilla." He further remarks that "when under a certain degree of increased pressure the construction in the evacuation will also become important here, and will lead to venal hyperæmia in the foremost ciliary veins. Besides lymph, formed elements will leave the vessels in consequence of the congestion, and trouble the transparent medium. If, at last, the stream in the veins is totally suppressed in the highest degree of the process, the congestion becomes stasis. Greater bleedings occur by laceration of the vessels and by evacuation of blood into the perichoroidal fissures. Solution of the choroid is caused. Violent neuralgia is the result of the lesion of the ciliary nerve." He thinks that "in the now-described course the clinical image of glaucoma simplex, glaucoma inflammatorium, and glaucoma hæmorrhagicum is easily found." For several reasons "he does not, however, consider it hazardous to connect the muscular system of the uvea with the pathogenesis of glaucoma." He believes that "the useful effect of sclerotomy can perfectly well be brought in accordance with this theory, but the removal of a piece of iris (iridectomy) this theory cannot explain. Clinically, the advantage of iridectomy over sclerotomy is in no manner true, for, together with the first operation, the second is also affected."

Krjukow[21 Mar.] thinks that the prevalence of glaucoma in hypermetropia must be sought for in the fact of the more frequent occurrence of this form of refraction than any other variety of ametropia.

In the report of Maklakoff, Moscow, Russia, corresponding editor, Logetschnikoff is credited with 287 cases of sclerotomy in glaucoma. The author attempts to give the precise indications for the choice of iridectomy or sclerotomy in the operative treatment of the affection. He believes in the theory of Kneiss and Weber, as presenting its proper etiology and pathological anatomy. He thinks that in all the varieties of glaucoma, except in the prodromal stages, both sclerotomy and iridectomy are indicated; iridectomy should always be preferred in the chronic and subacute types; in both acute and absolute glaucoma, sclerotomy should be preferred as a preparatory operation, to be succeeded by an iridectomy; in simple glaucoma sclerotomy is always to be preferred; in the prodromal period, or when it is not necessary to make a precipitate use of operative interference, we can rest content with myotics.

Gruening[1034] sums his experience with iridectomy in glaucoma as follows: 1. In acute inflammatory small glaucoma iridectomy yields brilliant results. 2. In chronic inflammatory glaucoma, without degenerative changes in the iris, iridectomy gives satisfactory results. 3. In chronic inflammatory glaucoma, with degenerative changes in the iris, neither iridectomy nor anterior sclerotomy gives to the patient the desired relief; posterior sclerotomy may do at times. 4. In simple glaucoma iridectomy generally maintains the *status quo antea*, and is therefore indicated. 5. In intermittent glaucoma the operation of iridectomy is often followed by reduction of sight.

In a discussion on the treatment of glaucoma, Hutchinson[76 Oct.] submits the following propositions for discussion: 1. As a rule, a free iridectomy is the safest and best treatment for all forms of primary glaucoma. 2. It is always well to use eserine before resorting to operation. In a very small minority eserine will be found to completely relieve the symptoms, and in a still smaller group the relief given by it may be permanent. 3. The continued use of eserine will very seldom suffice to prevent the recurrence of glaucomatous tension, and in any case in which, in spite of it, the sight is declining and the field contracting, an operation should be resorted to. 4. The cases in which eserine is most useful are, first, those in which the disease has been induced by atropine, and, next, those in which the disease recurs after long intervals. 5. The more nearly any case approaches to the type of acute glaucoma, the more probable it is that iridectomy will put an end to the process. 6. The more absolutely simple the case is,—that is, the more entirely free from pain, congestion, perception of halos, etc.,—the less is there to be hoped from an operation. 7. Cases of simple glaucoma are not, as a rule, benefited by the continuous use of eserine, and the choice lies between letting the disease run its course and an operation. The progress of simple glaucoma is often very slow, and the interval is often long before the second eye is affected. 8. It follows, from the last proposition, if simple glaucoma occurs in an old person, or in one in feeble health, that the patient's sight may easily last out his life. 9. Iridectomy for simple glaucoma is often followed by immediate deterioration in sight and advancing pallor of the disk, with or without recurrence of increased tension. It can by no means be regarded as a harmless operation. When iridectomy is done for simple glaucoma it should always be done very freely, and the patient should be prepared for the possibility that a second operation may be requisite. 10. In the first instance, iridectomy is preferable to sclerotomy, but if a relapse has occurred, then the latter may, in the hands of one well experienced in its performance, be a better procedure for a second operation. 11. A certain number of glaucomas, more especially those occurring in young adults, and in association with a definite inheritance of tendency to gout, should be treated with reference to that fact. 12. A certain number of cases of secondary glaucoma, especially those in connection with iritis, cyclitis, etc., are susceptible of permanent relief by eserine, and do not require an operation. This remark probably applies to most cases of increased tension in association with interstitial keratitis. 13. Although, as has been admitted, the prognosis after operation for simple glaucoma is always doubtful, it is yet the surgeon's duty to resort to operation in all cases in which the disease is definitely advancing, very old patients being alone excepted. 14. If after an operation for glaucoma recovery has once been well established, and the increase of tension completely relieved, it is very rare, indeed, for the disease to recur. Eyes once saved usually wear well. Critchett is inclined to doubt the wisdom of making a very large iridectomy in cases of simple glaucoma, preferring a moderately-sized one by the use of the keratome and making the incision in the sclerotic. Mules states that he makes the smallest iridectomy possible with the Tyrrell hook solely for the purpose of performing a large sclerotomy three days after. Little considers that eserine is of no use in chronic glaucoma, but has found a slightly-upward iridectomy valuable in all cases where the premonitory stage is distinctly and satisfactorily determined.

Charles S. Bull[1 Aug.10] says that, in endeavoring to draw some rational conclusions from the study of 90 cases of simple chronic glaucoma, it seems wise to begin with a quotation from Priestley Smith, to whom ophthalmologists owe so much of their knowledge of the pathogeny and pathology of glaucoma: 1. In considering the expediency of an operation in simple chronic glaucoma, he says: "In every case of chronic glaucoma the responsibility of advising an operation is a heavy one, and should on no account be undertaken without a full explanation to the patient or his friends of the almost positive certainty of blindness, on the one hand, and of the uncertainties which beset the operation, on the other. Having regard to the age of the patient, the impossibility of great benefit, and the possibility of a painful and accelerated progress, a prudent surgeon will only operate on the express desire of the patient to receive the only possible chance of benefit, however small it may be." Armed with the preceding precaution, it seems to be our duty to operate in cases of chronic progressive glaucoma, and the earlier the better. 2. If the disease in a given case seems to be stationary and is still in the primary stage, and if it be possible to test the vision and the visual field at short intervals, delay in operating is permissible; but a weak solution of eserine or pilocarpine should be used daily, merely as an aid in controlling the course of the disease. The examination of these patients should be at short intervals, and should invariably include the tests for visual acuity and the careful examination of the visual field. 3. If the disease exists in both eyes, but with useful vision in both, the eye in which the disease is the most advanced should be operated upon without delay, and the surgeon will be guided in his treatment of the fellow-eye by the result of the operation on the first eye. 4. To insure the best result, the incision should be made well in the sclerotic with a narrow cataract-knife or a very broad lance-knife, and the entire segment of iris, from one end of the incision to the other, should be carefully torn or excised from its insertion. 5. The most carefully performed iridectomy by skillful hands is sometimes followed by the rapid loss of what sight still remains, sometimes partial, but, unfortunately, sometimes also total. 6. A successful result is, in the majority of cases, more likely to follow the operation if it is performed early in the course of the disease, but the preservation of the existing degree of vision even in these cases is not invariable. 7. As regards the question of symmetry, it is probable that in the large majority of cases, perhaps as much as 80 per cent., the disease is sooner or later present in both eyes, and a careful study of the cases seems to establish the fact that there can be no specified or certain interval of time which insures the second eye against an attack. 8. If the patient is old and feeble, and one eye is still free from the disease for a year or more after the other eye has become affected, it may be considered prudent to avoid an operation on the affected eye, as it is probable that the unaffected eye may remain free during the remainder of the patient's life. 9. The condition of the field of vision is no constant guide, either in forming a prognosis as to the progress of the disease or in deciding as to the time of operation. 10. The acuity of vision bears no constant relation to either the success or the failure of the operation. 11. The anterior chamber is usually shallow, is occasionally entirely absent, but is often apparently normal in depth. The condition of the chamber gives no reliable hint as to the state of the vision or the visual field, nor any indication as to prognosis. 12. The appearance and motility of the iris appear to have some bearing upon the prognosis, though not, perhaps, to the extent believed by Nettleship. The latter states that in the cases in which the iris reacted rapidly to eserine the operation proved successful. This has not always been the experience of Bull, but in the majority of the cases in which eserine caused rapid contraction of the pupil the visual acuity was fairly good and the field was not seriously limited. 13. The depth of the excavation in and the color of the optic disk seem to have no close connection with the defect in vision or with the limitation with the visual field, nor do they offer any constant guide as to prognosis or to the effect of an operation upon the progress of the disease. 14. The condition of the intra-ocular tension is a very uncertain guide in deciding the time for operating. It may be normal or increased, or even diminished. It does not seem to bear any constant relation to the degree of visual acuity or to the state of the visual field. The steady maintenance of an increased tension, however, without any diminution, almost invariably indicates the necessity for an immediate operation, and this necessity is especially indicated if the tension is continually on the increase. 15. The health and age of the patient exert a decided influence upon the effect of the operation, and any marked evidence of senility is distinctly unfavorable to operation."

Hirschberg[190 Sept.] has performed iridectomy upon a case of almost absolute glaucoma during an attack of marked gummatous iritis, with pupillary occlusion, the coloboma being made inferiorly, at a point opposite to the gummatous mass. Following the operation, mercurial inunctions were employed. Pain was promptly relieved and intra-ocular tension fell to normal.

Keyser[9 Aug. 8] has had 2 cases of "glaucoma fulminans" to follow, in five and nine days' time, the modified Graefe operation for cataract. In both hæmorrhage occurred and tension rose to plus 3. One eye was destroyed, but the other was saved by an early additional iridectomy.

Dabney[224 Feb. 16] reports a case in which the instillation of 2 drops of a 4-per-cent. solution of atropia in the eye of a man 22 years of age, suffering from muco-purulent conjunctivitis, induced symptoms of acute glaucoma. In ten days' time vision had returned to normal. It is very interesting to note that the patient's mother had glaucoma.

Snell[2 May 11] gives the notes of a case in which an attack of glaucoma supervened two and a half years after puncture of the sclera for detachment of the retina, the eyeballs being staphylomatous at the site of the wound-puncture. Enucleation was performed, and a spindle-shaped growth was found situated internally to the staphyloma. Microscopically, the mass suggested an inflammatory condition. Macnaughton Jones finds that pilocarpine possesses advantages over eserine in various glaucomatous conditions, whilst

Cross recommends iridectomy when the pupil does not properly respond to eserine. Hill Griffith is satisfied with the curative effect of iridectomy in all cases except glaucoma consummatum.

Adamük,[725 Jan.] as stated by Maklakoff, corresponding editor, gives the description of 2 cases of glaucoma in aphakic eyes. He lays stress upon the condition of the venæ vorticosæ in this affection.

Krukoff[725 July, Oct.] tells us that in twelve years he has seen 1430 cases of glaucoma out of a total of 48,828 cases of eye diseases. He finds that its occurrence in Russia is much more frequent amongst the natives of Slavonia.

WOUNDS, INJURIES, AND FOREIGN BODIES IN THE EYE.

Talko[353 Dec.,'88] has examined the effects of a total eclipse of the sun upon the power of vision of an individual with perfectly normal conditions. He arrived at the unexpected interesting results that, after half an hour of the eclipse (which lasted altogether two hours) the visual power had not changed, and at the moment of perfect eclipse it was decreased by two and one-half times, though it rapidly recovered after the eclipse passed, having within five minutes after the time of total eclipse regained normal acuity.

Magawly[445 No. 4] has seen central scotomata for red and visual reduction to one-fourth, with an apparently normal fundus, in 3 cases caused by undue exposure to solar rays, whilst the patients were making observation upon an eclipse. By actual exclusion of light, followed by the after-use of dark glasses, perfect recovery took place.

A valuable article on superficial injuries to the eyeball has been written by Ramsay.[218 Mar.] Many interesting points are given in the paper.

Lubinsky[726 May] has been very fortunately placed so as to study the effect of the electric light upon the eye. He has seen 30 cases; the symptoms, which consist in a morning exacerbation of photopsia, accompanied by an evening attack of lachrymation and photophobia,—the conjunctiva and lids being puffed and swollen,—last from twenty-four to forty-eight hours. The ophthalmoscope fails to reveal anything more than a "slight congestion" of the optic-nerve tip. These conditions are produced by direct exposure to the very strongest lights. He terms the disease "ophthalmia photo-electrica."

Maklakoff,$^{725}_{\text{Jan}}$ in Moscow, Russia, corresponding editor, has studied the effect of the "voltaic light" on the eyes. He has made two experiments on himself. He believes that the affection of the eyes is but a variety of cutaneous disturbance produced by the chromic action of the luminous rays of the voltaic arc. He exposed himself to a light equivalent to 1000-candle power. The resultant pain lasted about forty minutes, which was followed by chromopsia, neuralgia, and local congestion. From his researches, he concludes that the voltaic arc acts nearly always by the chemical properties of its light; the ocular affection is that of a variety of skin disorder, the symptoms being dependent upon difference of structure and function of the eyes and head; the influence of the voltaic light on the head is of a character of a vasomotor affection; and, lastly, he thinks that the resultant erythema is easily propagated to the surrounding parts.

Webster,$^{60}_{\text{Jan 30}}$ reports a case in which croton-oil liniment was accidentally applied to the eyelids, causing swelling of the lids, congestion of the eyeballs, and considerable loss of corneal epithelium. Complete recovery occurred under the use of a solution of atropine and castor-oil and a protective bandage.

In a very practical paper on railroad injuries of the eye, Fulton,$^{105}_{\text{July 15}}$ says: "The surgeon should approach an open eyeball with as much caution as he would a penetrating wound of any other cavity of the body, and should treat it exactly upon the same principle." He advocates the removal of traumatic cataracts, for the reason that the visual result will be very useful to the patient, increasing the field of vision and preventing the possibility of calcareous degeneration which a partially-absorbed lens so frequently undergoes, resulting in future trouble to various parts of the eyeball.

For the treatment of foreign bodies in the eye, Jeaffreson $^{6}_{\text{Sept 3}}$ gives the following rules, which we quote verbatim: "1. When an eye is hopelessly and irremediably destroyed it should be at once removed. 2. When an eye does not seem to be irremediably and hopelessly destroyed every effort should be made to retain it. If there is reason to suppose it contains a foreign body, search may be made, provided always that there is reasonable probability that the foreign body will be removed and the damage to the eye not increased in an important degree. 3. In removing foreign bodies that are attached or imbedded in the iris, chloroform should be freely administered. 4. Foreign bodies in the lens, and not involving other structures, should not be removed too early; time should be given for the whole lens to soften and liquefy."

In a criticism upon the above paper, Snell[6, Oct. 5] again brings forward the claim of the electro-magnet, to which Jeaffreson[6, Oct. 19] replies that he considers the electro-magnet a very much overestimated instrument; for, if it has saved some eyes in the hands of skillful operators, its extensive diffusion has led to not a few being sacrificed to promiscuous and haphazard probings.

Briggs[147, Aug.] gives notes of 9 cases in which the electro-magnet was used successfully in removing foreign bodies from the eye. From his experience, he concludes that the electro-magnet is generally a safer instrument than the forceps for the extraction of fragments from the anterior chamber, from the lens, from the iris, or from the anterior portion of the lens, and that it is practically our only resource when the steel has penetrated the vitreous chamber; lastly, he asserts that it is safer to retain extensively injured eyes, if the offending body be properly removed and thorough asepsis observed.

In wounds of the ciliary region, Menacho, as reported by Chiralt, of Seville, Spain, corresponding editor, from various well-known reasons, prefers enucleation to evisceration.

In a study of the comparative values of evisceration and enucleation, Calderon[682] says that the former is more valuable in the cases of inflammation where there is no protrusion of the globe, but where the panophthalmitis is accompanied by proptosis enucleation is the better; and although evisceration offers better conditions for the adaptation of an artificial eye, yet the introduction of an artificial vitreous greatly favors sympathetic ophthalmia. In fine, he prefers enucleation when done under strict antisepsis. (Chiralt, of Seville, Spain, corresponding editor.)

Phillips[776, Jan.] reports 3 cases of successful extraction of fragments of steel from the eyeball by the use of the electro-magnet. In those cases where the foreign body cannot be removed he advises immediate extirpation of the injured eye.

In discussing the subject of enucleation during panophthalmitis suppurativa, Noyes[1084] most properly says, in conclusion of his paper, after the recital of an interesting case of the acute type saved from death after manifest cerebral symptoms by vigorous incisions, giving vent to secretions with powerful antisepsis, that "it must not be inferred that I am in favor of enucleation of the eye in every case of purulent panophthalmitis. Some cases may be brought through a lingering process without doing it, yet, for the large class to whom this misfortune happens, whose daily bread depends upon daily wages, enucleation is the most humane and time-saving alternative."

O. F. Wadsworth$^{90}_{\text{Apr. 18}}$ has successfully extracted a piece of steel from the vitreous by inserting the point of an electro-magnet through a cut made in the sclerotic behind the ciliary body. Four weeks after the operation the vision equaled $\frac{14}{\text{XII}}$. The case is an interesting example of how slight damage may be occasionally produced by the wounding of parts of the eye especially susceptible.

In panophthalmitis where enucleation has been done, as well as in those cases in which meningitis has occurred without previous enucleation, Andrews$^{1}_{\text{Dec. 29, '88}}$ believes that the veins are the chief channels along which the infection is carried to the brain. He is disposed to favor enucleation, as he deems that evisceration is not a barrier to the disaster. The danger of infection is met by thorough antisepsis during and after the operation, the object being to prevent the further retention and absorption of septic matter: this the author thinks is best obtained by discarding the compress-bandage to the lids and by keeping the wound in the orbit purified by proper drainage.

In a short lecture on simple inflammations of the eye, Jackson$^{19}_{\text{Aug. 31}}$ has given many valuable and practical points.

Based upon the observations of others and the results obtained from a series of operations performed on 3 rabbits, Claiborne$^{40}_{\text{May}}$ concludes that "the operation of enucleation of the eyeball does not leave behind in the socket enough of a prominence to permit the accurate and comfortable fitting of glass eyes. The operation of evisceration, while it leaves behind a better stump than the operation of enucleation, is open to obvious objections. The operation of Mules, of England, is objectionable because it subjects the ciliary nerves to constant pressure between two hard and unyielding surfaces. The transplantation of sponge and cotton into the intra-scleral cavity is probably not feasible in human beings. The transplantation into the intra-scleral cavity of some soft, yielding body, which will not degenerate, which can be rendered antiseptic, which will not swell by imbibition, and which will not become absorbed, seems to be a rational procedure. Based as yet upon no experimental observation or experience, I suggest glass wool, asbestos, and India-rubber hollow balls, as artificial 'vitreous bodies in modification of Mules's operation.'"

Chibret[78, May] recommends the ablation of only the infected portions of the eye in panophthalmitis, taking care to inject a strong solution (1 to 1000) of oxycyanide of mercury into the remaining stump. He has successfully operated in this manner on 5 cases.

As well known to any one well acquainted in clinical studies, Wagenmann[8, Oct.17] finds, after operations on the eye or subsequent to cicatrized prolapsed irides, or even following synechia, that there appear purulent infiltrations of the vitreous, with rapid decrease of visual acuity. In 18 cases collected in the Göttingen clinic (4 subsequent to cataract extraction, 1 after iridectomy for glaucoma, and the remaining 13 associated with adherent leucoma), of which 12 were examined anatomically, there seemed to be both clinical and anatomical proof that an infection had its starting-point at the sight of the scar. Cocci could be followed in a thick train, as it were, from the place of traumatism far into the interior of the globe, though none could ever be determined in the lumen of the vessels. Due to these facts, the author considers such cases altogether extogenic, in which view he is supported by Leber. Meyer and Schmidt-Rimpler, however, admit an additional endogenous variety.

The following objections to the theory that sympathetic ophthalmia is caused by a streptococcus are given by Keyser[62, Mar.1]: It is not always necessary to have pus formation in a diseased or injured eye to create sympathetic ophthalmia; that it does not exhibit itself in cases of panophthalmitis where there is generally a profuse pus formation; and, lastly, that sympathetic ophthalmia has been stopped in its process by treatment and operation.

In an elaborate article by Schoebl[254, June] upon so-called hyperplastic inflammations of the ocular tunics, the author arrives at the following conclusions: 1. From an etiological stand-point, the hyperplastic inflammation appears mostly after severe injuries of the bulbus, but may also develop as a consequence of long-continued idiopathic and especially purulent inflammation. 2. Clinically, it usually appears as an intra-ocular or extra-ocular tumor, often gliomatous, and most frequently exhibiting signs of the "amaurotic cat's eye." It can, under certain circumstances, simulate a protruding intra-ocular growth, and, lastly, may appear under the guise of an iridochoroiditis, with apparent cyclitic products in the vitreous humor. 3. In diagnosis it can be most easily mistaken for tumor. It also becomes necessary to make differential diagnosis between trauma and long-standing inflammation. 4. Anatomically, the hyperplastic inflammation is of the coats of the eyeball, and the condition is peculiarly similar to granulation, a process leading to hyperplasia, and "forms," so to speak, a link from inflammatory to neoplastic processes. 5. In regard to therapeutics, in many cases where a malignant tumor cannot be excluded with certainty; further, where the pain is excessive; or, as a preventive measure, where the possibility of a sympathetic affection exists, an early enucleation is indicated.

A rare example of cure obtained by the removal of a pyogenic focus from an old cataract-scar at the sclero-corneal junction, in which well-advanced symptoms of general ocular infection had manifested themselves, is reported by Hirschberg.[190 Sept.] The author says that a thin coagulation membrane in the anterior portion of the vitreous plainly indicated the gravity of the disturbance.

Bahr and Garnier[254 Aug.] state that a strong child, 14 months old, became affected most probably with rubeola. On the third day a non-inflammatory affection of the eye developed, which increased gradually until the tenth day, when the child was admitted into the clinic. The patient was feverless, but had purulent infiltration of the cornea. On the thirteenth day perforation of the cornea ensued. Two days later general fever came on, followed by depression until, after seven days, death took place. Bacteriological examination showed intra-ocular diplococci and streptococci, with infiltration into the optic nerve, the cerebro-spinal fluid, and the cerebral meninges. Right keratomalacia with corresponding purulent meningitis, complicated by purulent bronchitis, were found post-mortem. There were also pulmonary atelectases, swelling of the spleen, with slight parenchymatous inflammation of both the liver and kidneys. The case is interesting as compared with the one reported by Leber and Wagenmann.[204] Bahr and Garnier do not believe that in their case the eye affection was due to secondary infection from a primary disease of central origin, but assume that the general infection took its origin from the corneal perforation. If this be true, the case is of value through the fact that it demonstrates that a suppurating eye can cause death by failure of removal. According to these authors' views, it would also seem to corroborate the belief of those who hold that death after enucleation need not necessarily be attributed to the operation.

Prince[61, Oct. 13] again calls attention to the value of the application of pure carbolic acid in evisceration to the entire inner scleral wall after removal of the corneal and bulbar contents, and further asserts that in order to secure a better stump the eviscerated globe should be lightly packed with pulverized iodoform. The author's conclusion from his experience with this method is, that although the subsequent shrinkage is more than could be wished, the resulting stump is sufficiently better than that following enucleation to lead to its preference in all cases, except in those of suspected malignancy and those in which the fellow-eye is deeply situated in the orbit.

Ludwig's case[190, Feb.] of ocular traumatism with subsequent meningitis is said to be remarkable on account of the complex sequelæ: rupture of the choroid, a "pseudo-cysticercus" in the vitreous, vertical nystagmus, all of the same eye; and hippus.

Garcia Calderon,[456, May] as reported by Chiralt, corresponding editor in Seville, Spain, has enucleated a phthisical globe containing an irregular ossification of the choroid in a case of sympathetic irritation. He obtained a preservation of one-third vision in the sympathizing eye.

In a short article on the question whether a surgeon can remove the wrong eye of a patient who is under the effects of chloroform, Chisolm[187, Aug. 20] answers most decidedly in the negative.

In a lecture upon ocular traumatism, its medico-legal importance, and its relation to accident insurance, Hershing[190, Sept.] endeavors to formulate rules governing the grade of monocular and binocular visual strength in reference to the character of employment, deeming that the loss of the usefulness of one eye militates against accurate adjustment dependent upon stereoscopic vision.

Where traumatism is limited to one eye, leaving the fellow intact, Moses[190, Sept.] agrees that one-third of the full amount of damages given when both eyes are lost should be awarded; if the uninjured eye should have reduced vision, varying grades of increase should be given: Thus, one to one-third, 33⅓ per cent.; one-third to one-sixth, 40 per cent.; one-sixth to one-twelfth, 45 per cent.; one-twelfth to one-fifteenth, 50 to 60 per cent.; one-fiftieth to one two-hundredth, 60 to 80 per cent.; one two-hundredth to zero, 80 to 100 per cent.

THERAPEUTICS.

De Vriesse,[171 Mar.] in experimenting upon éphédrine and pseudo-éphédrine, finds that the former drug, in solution of 6 to 7 per cent., gives pupillary dilatation in a great number of cases in forty to fifty minutes, whilst the instillation of 2 drops of a 10-per-cent. solution causes an equivalent result in forty to sixty minutes, the pupil returning to its normal size in sixty-nine hours. Accommodation is but little affected. Very young and old subjects are more prone to its action. If the iris be irritated or inflamed the influence of the drug is much lessened. According to the author, intra-ocular tension is not disturbed. From these experiences he concludes that it is useful for ophthalmoscopic employment. Several instillations of an indeterminate quantity of the latter drug gave strong dilatation of the pupil in thirty to forty minutes when a 10- or 12-per-cent. solution was used, this varying slightly according to idiosyncrasy. The pupil returned to normal in about nine hours. Intra-ocular tension is said to be unaffected.

Based upon his own experience and the published results of others, Minney, after deciding in favor of the use of hot water after the method employed by Conner (though not agreeing in the conclusion that there is no possible harm in its use), asserts that "it is the one application that has as few disadvantages or drawbacks as any other *one agent*, aside from the trouble it involves," and believes that it acts as a valuable, safe, and efficient hæmostatic in operations as long as there is an outward flow from the divided arterioles, venules, and lymph-spaces.

Eversbusch[34 No. 13] deems the danger of chloroform narcosis greatly increased in an atmosphere of coal-gas illumination, as shown by laryngeal irritation and spasmodic cough, evidenced by all present at the time of operation. If so, this may be of value to remember by those who make use of this anæsthetic in eye surgery.

In an article on antiseptics in eye surgery, Herbert Harlan,[104 Mar. 28] believing that the eye is usually aseptic and eye instruments fairly clean, states that he prefers, "as the method which will do the greatest good and the least harm to the greatest number of patients," to wash all instruments before and after use in hot water, to carefully express the contents of the lachrymal sac, and to wash the conjunctiva and the lids with a saturated solution of boracic acid immediately before operating.

Reich[190 Ap.] has seen repeated epistaxis occur in a 17-year-old patient, in whose eye he had instilled $\frac{1}{120}$ grain of neutral sulphate of atropia. Duboisia had the same effect. The case showed symptoms of progressive myopia.

An additional case of the toxic effect of atropine-drops in a 7-year-old girl is reported by W. J. Tyson.[2 Oct.26]

The value of cubebs in the treatment of urethral gonorrhœa has led Heyl[112 Sept.] to employ the same remedy locally in the form of an ointment in gonorrhœal ophthalmia met with in adults. He applies the salve in the strength of 5 to 10 grains (0.3 to 0.6 gramme) to 1 drachm (3.8 grammes) of lanoline to the outer surface of the lids. He suggests that the cubebs act either directly on the bacteria or place the epithelial tissue in such a condition that the micro-organisms cannot feed upon it.

From the great benefit derived from the use of dioxide of hydrogen in the treatment of a case of purulent ophthalmia, and having seen its great usefulness in other purulent processes, T. S. K. Morton[9 v.2, p.716] thinks that it will likewise be found beneficial in gonorrhœal and other septic ophthalmiæ.

H. A. Allbutt[129 Mar.] claims good results in 2 cases of catarrhal and purulent conjunctivitis from the internal administration of granules of brucine and hydroferrocyanate of quinine, limiting the local applications in the first case to an ointment of red oxide of mercury and sulphate of atropia. In the first instance aconitine and veratrine were added on account of fever and low condition of health.

Illingworth, of Accrington, England, collaborator, thinks that borax is a remedy deserving of further notice in the treatment of corneal ulcers and concomitant inflammations. He associates its use with tincture of belladonna.

Alt[347 Jan.] adds his testimony to that of Purtscher in strongly recommending creolin in parenchymatous keratitis. He further thinks it useful as a disinfectant for surgical instruments and as a hæmostatic. He employs it in 1- and 2-per-cent. solutions, and thinks it is advisable to prepare but a small quantity at a time.

For the relief of the irritation and corneal ulceration induced by a conjunctival cicatrix, S. Mitchell, Jr.,[59 Aug.] has employed castor-oil as a menstruum for cocaine with excellent results.

In five days' time Dejace[129 Jan.] successfully overcame the photophobia dependent upon scrofulous keratitis by the internal administration of granules of cicutine and the local instillation of atropine.

Harrison[149 Dec.,'88] claims better results from the use of a 2-grain (0.13 gramme to 30 cubic centimetres) solution of muriate of pilocarpine in the early stages of phlyctenular keratitis than from any other local application.

An editorial[9 Feb.,'88] invites attention to the various indications for the employment of massage in the treatment of eye diseases, and says that the results obtained by its conscientious use justify a more extended trial.

In cases of corneal opacity, de Schweinitz[112 Sept.] has obtained marked improvement of vision by the systematic use of massage. The method which had been found most useful in the hands of Pfalz consists in the introduction of a small particle of yellow oxide-of-mercury salve into the conjunctival *cul-de-sac*, followed by rubbing the lid for a few minutes at a time over successive corneal sectors and concentric circles.

Delagénière[274 Jan.] believes that in naphthol we have one of the best therapeutic agents now used in the simple types of granular conjunctivitis, although it is of no value against the cicatrization of the tarsal cartilage. Care should be taken in its use when the cornea is ulcerated.

Tselio[791 Nov.,'88] claims rapid improvement of an inveterate and persistent case of granular conjunctivitis by the use of atropine, associated with daily instillations of a 10-per-cent. solution of creoline.

Mittendorf[101 Jan.] commends solutions of boric acid, varying in strength from 10 to 20 grains to the ounce, as antiseptic in preference to solutions of bichloride of mercury, because of the irritating effects of the latter drug upon the conjunctiva and cornea.

As an adjuvant to atropia in the treatment of iritis with firm posterior synechia, Chas. E. Michel[781 May] finds hot water of great assistance.

S. Mitchell[347 Sept.] has had opportunity to test the merits of eserine in the treatment of episcleritis in 3 cases, 2 of which had their refractive errors corrected. The benefit derived was both prompt and lasting.

In order to study the value of the results obtained by Panas, Dor, Bouchardat, and Charmi, and more recently by Hesse and Magnus, Kollinsky[725 Jan.] has made experiments bearing upon the action of naphthaline in cataract. He believes that the phenomena of naphthaline intoxication seen in the eye are seemingly more pronounced than in the other organs of the body on account of the greater ease of observation of the disturbance of this organ.

The juice of cineraria maritima, in 1- to 2- drop instillations three times daily, has been lauded as a specific in the non-operative treatment of cataract.[760 June 15]

Gabaldon[129 Feb.] overcomes spasmodic movements of the ocular globe and complete contraction of the iris occurring during a cataract operation by administering granules of hyoscyamine, the use of the drug permitting the operation to proceed to a successful completion.

Believing that it is impossible to restrict the diffusion of cocaine from the cellular tissue of the orbit during the operation for enucleation, Dabney[224 Aug. 3] coincides in the opinion that the use of the drug in such instances is decidedly dangerous.

Chibret[173 Jan.] finds that both the hæmorrhage and pain consecutive to enucleation are avoided by previous injections of a solution of 1 gramme (15 grains) of antipyrin with 0.2 centigrammes (3 grains) of hydrochlorate of cocaine in 2 grammes (32 minims) of water into the orbit.

Fraenkel[853 Feb.] recommends framed sheets of glycerin-gelatin tinted with aniline purple, placed between two thin plane-glasses, as of value in the better selection of color amongst the possessors of subnormal color-perception.

Lindsay Johnson[2 Sept. 28] reports some observations on the therapeutic effects of the violet end of the spectrum on vision. The result was obtained by the constant use of closely-fitting frames containing glasses which cut off all the red, orange, and yellow rays to within 10 degrees of the E line of the spectrum. According to the author's statement, the most satisfactory results were obtained in cases of detached retina, optic neuritis, and neuro-retinitis.

Anderson[1033 V.9] thinks that the liability to oxidation by exposure of ointments intended for application to the eye (as well as contamination by dust and dirt falling into them when uncovered, or introduced when powders are taken out for use), when they are kept, in the usual way, in small boxes or pots, can be avoided by employing collapsible lead tubes like those used for oil-paints, asserting that a small quantity, which is always fresh and clean, can be squeezed out instantly in a convenient form. To this I must take exception, having in 1884 made quite a number of experiments with the method, in which I[9 Aug.9,'84] arrived at the following conclusion: "In the dispensing of eye ointments, collapsible metallic tubes are useful by reason of cleanliness, economy, non-exposure of the contained drug to the atmosphere, readiness and facility of application, better regulation of the amount to be used, and less risk and greater ease in carriage; whilst they are contra-indicated by difficulty of expulsion of stiff ointment and chemical change, causing either a deposition of some of the elements of the tube into the ointment or an action upon the contained delicate substance, rendering it either useless or harmful. Consequently, at present, until some better material can be employed in the manufacture of collapsible tubes, it will be better to continue the use of wood, glass, and porcelain, to insure purity of drug and surety of action."

R. L. Thomson[82 Feb.3] pertinently remarks that the "practice of habitually prescribing on general principles often leads to grievous errors, the medicines given doing more harm than good. Drugs should be used to produce a definite effect, and if this is not obtained in a limited time they should be suspended, that the true condition of the patient may be known. Of course, this does not hold good when danger is imminent."

Bronner[2 Feb.23] gives a number of practical suggestions in antiseptic surgery, and calls attention to the importance of having all solutions intended for instillation during operation, especially cocaine, atropine, eserine, etc., made antiseptic. He says: "Should there be any suppuration in a corneal wound, this can in most cases be prevented from progressing by energetic antiseptic treatment; that is, the wound must be opened, the anterior chamber washed out with 1 to 1000 sublimate solution, and then the edges of the wound burnt by the galvano-cautery. This should be repeated, if necessary, every five or six hours."

INSTRUMENTS.

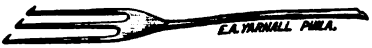
A record-blank for aid in ophthalmic practice has been devised by Allyn.[161 Feb.] It consists of a blank, which contains parallel columns of words bearing upon the subject under investigation. In noting the case, the related adjectives and nouns descriptive of the condition present are joined by a stroke.

A portable perimeter, intended to be held in the hand of the patient, has been devised by Schweigger.[254 Feb.] It consists of an ordinary 120-degree arc, with 90 degrees on one side and 30 on the other, the fixation-point standing at zero. This is securely fastened to a supporting arc, to which, at the other end, is attached the handle and head-rest.

W. N. Whitney, of Tokio, Japan, corresponding editor, sends us the following description of an ocular fixation mirror: "This instrument (not heretofore described) consists of a piece held on the forehead of the patient by an elastic band, after the manner of the mirror of the laryngoscope, to which is attached, by an arm 3 inches (7.6 centimetres) in length, furnished with universal joints at each end, a plain mirror, measuring about 1½ inches (3.8 centimetres) square. The mirror carries a frame, into which lenses of a standard trial case can be dropped. The mirror, when in position, stands at an angle of about 45 degrees to the horizontal tangent of the surface of either cornea, so that the patient sees an object at right angles to his axis of vision instead of directly in front of him. The uncovered eye can then be freely examined with the ophthalmoscope, without any inclination upon the part of the patient to rotation, through the eclipse caused by the physician's head coming between the patient's eye and the object as he explores the different portions of the fundus. This, of course, is only necessary in using the direct method of examination. The mirror, by reason of its universal attachment, can be set in front of either eye at pleasure. The author has found it a great convenience in his practice, especially in examining the eyes of children or of patients who find difficulty in fixing, under the ordinary mode followed, for 20 feet (6 metres) directly in front. The clip holds the necessary lens to correct myopia or hypermetropia for 20 feet (6 metres), so that the accommodation can be relaxed." The author has also used a spectacle-frame with a reversible mirror, which can be placed at an angle of 45 degrees opposite either eye in the axis of vision.

Anderson $^{26}_{\text{Jan.1}}$ has devised a bench to be used during operations on the eyes of children. It is made of the ordinary height of a chair, with a top 4 feet 6 inches (1.36 metres) long by 1 foot (30 centimetres) wide. On each side, near the middle, a part of the seat is cut away, so as to allow the operator to bring his knees nearly together. The surgeon sits astride of the bench, and the child is laid on its back so that its head rests between the operator's knees.

Walker $^{6}_{\text{Feb.9}}$ has modified the spring eye-speculum. The instrument, as constructed by him, is applied from the nasal side of the eye, for which purpose it has a special curve to enable it to pass in front of the nose. The advantages claimed are that it does not inconvenience the operator and can be more readily manipulated by an assistant.



HANSELL'S FORK FOR THE EXTRACTION OF A DISLOCATED LENS.
(*Medical News.*)

Weeks $^{59}_{\text{Aug.10}}$ has added a strabismometer to a small pocket retinoscope and pupillometer, which had been devised by a London maker of optical instruments, by first arranging the instrument so that the 90-degree notch is made to cut the visual line when it falls upon a converged point at 14 inches. The contrivance is used as a perimeter in the horizontal meridian in such a way as to measure the amount of lateral deviation of the eye.

Bettremieux $^{274}_{\text{Jan.}}$ has made a change in the blade of the ordinary cataract-knife, by which the sides and back are made to assume a right-angled triangle instead of an isosceles triangle, thus rendering the liability of wounding the iris much less than in the usual pattern.

The above wood-cut represents an instrument for the extraction of a dislocated lens. It was devised by Hansell $^{9}_{\text{Feb.18}}$ for the removal of a lens which had been traumatically dislocated behind the iris. The advantages claimed for the instrument are that it will remove a lens equally well with or without its capsule; its insertion necessitates no displacement or disturbance of the vitreous in the removal of a lens dislocated behind the iris; and, both shank and fork being malleable, the instrument is available in all cases where the lens can be seen.

Another electro-magnet has made its appearance: this time by Tiffany,[72 Jan.] who has modified Hirschberg's well-known pattern. As a means for the location and removal of foreign bodies situated in the orbit, he considers it far superior, in both safety and surety, to any other method at our disposal.

Landolt, of Paris, corresponding editor, has devised a series of differently-shaped "plaques" (for both adults and children) to be used in operations about the upper lid. They permit of larger extent of the operative field, with more complete absence of any disturbing blood.

UNCLASSIFIED.

In a desire to enhance the value of the United States census of 1890 in its statistics bearing upon the causes of blindness, Tilley[61 Sept.21] suggests that the recognized form made use of by Magnus should be used by the ordinary census officers, reserving the technical classification for those who are more intimately acquainted with the subject.

Maklakoff, of Moscow, Russia, corresponding editor, informs us that Beloff[725 Jan.] suggests that the detection of simulation of defective vision may be obtained by noting whether the proportion between the size of the ordinary test-type of Snellen and the distance to be seen at remains as a fixed ratio at variously-chosen distances, this being done by having the subject stand as far away from the largest type on the card that he may claim to see, and then to gradually approach him toward the letters, and note the distances at which the various lines are named, thus possibly obtaining the proper distances for the smaller letters of the series. For the same purpose, Rosanoff[725 Jan.] adopts the ingenious arrangement of a plane-mirror of 10 centimetres (4 inches) in diameter, a series of transparent letters, and a lamp. The malingerer is made to look into the mirror at the letters, when, by an easy calculation, any deceit is readily rendered apparent.

A leading article[2 Jan.] favors, in addition to the ordinary hygiene of the eyes, the abolition of the grant-earning system in schools, as it causes children to be worked to the limit of their capability without regard to the eye-sight or general health.

As the results of investigation amongst the inmates of the South Boston Asylum, where the percentage is 50 cases (27 per cent.) of preventable blindness (34 from ophthalmia neonatorum, 4 from "trachoma," and 12 from sympathetic ophthalmia), Derby[99 Oct.26] comes to the conclusion that "to diminish such a percentage in the future the more careful medical education of the present day will not alone suffice. Those who propose to follow the profession of medicine must also be properly instructed, and some degree of knowledge of these subjects should be diffused in the community."

Mason[2 Feb.23] saw a patient in whom, seven hours before death, the eyes presented the appearance usually seen immediately preceding general dissolution. The corneæ were lustreless and covered with a glairy film. The eyeballs were flaccid, causing the pupils to become distorted upon the slightest pressure. C. A. O.

MEDICAL OPHTHALMOLOGY.

Hughlings Jackson's lecture[6 Oct.26] is a capital sermon upon a text requiring much emphatic repetition: "The best and most hopeful feature of ophthalmolgy is that it has relations, closer or more remote, with every branch of medicine and surgery—indeed, with almost every branch of science." Chiralt, of Seville, Spain, corresponding editor, extracted a *filaria of the eye* (lid and conjunctiva) 3 centimetres (1 inch) long. The next year the same patient was found to have "a multitude" in various regions of the body. Mercurial inunctions effected a cure. Oeller[34 No.19] had a case of blindness and optic atrophy following *erysipelas.* The retinal vessels were very narrow. Sattler's case of *herpes zoster*[8 No.7] followed poisoning by carbon dioxide. Death ensued in fourteen days after the appearance of the herpes of the first branch of the trigeminus, the herpes having succeeded the poisoning in four days. The post-mortem examination showed an inflammatory infiltration of the median part of the ganglion of Gasser and disappearance of the ganglionic cells. The degenerative fibres proceeding thence were traced to the globe of the eye. Dardignac[92 Oct.,'88] reports a case of extensive corneal infiltration and iritis, with neuralgia of the trigeminus and herpes zoster, persisting for four weeks, and relieved, as it were, by a metastasis of the inflammation to the parotid gland. As the parotitis came on, the ocular troubles disappeared. Schäffer,[34 No.36] from his case of herpes zoster following a case of croupous pneumonia, strangely argues that this affection is infectious, and caused by the toxic matter of some pathogenic microbe. For the abortive treatment of herpes, Dupas[245 Dec.] recommends the application of 90-per-cent. alcohol, or a solution either of 2 parts of resorcin, 1 part of thymol, 3 parts of menthol, or 2 parts of tannin in 100 parts of 90-per-cent. alcohol. A compress should be saturated with one of the solutions, bound upon the diseased part, and covered with an impermeable material. The dressing should be frequently renewed.

Mules[76 Oct.] proposes a reclassification of certain eye diseases under the name of *ophthalmic trophoneuroses*, which are to comprise the phenomena due to nutritive changes from neuritis of the ophthalmic branch of the fifth nerve. One can but wonder if interstitial keratitis, scleritis, episcleritis, etc., can be often due to such a cause.

Meyer and Berger[204 B.34,H.4] give a thorough report of a case of a *leprous tumor* of the cornea occurring in a woman of 36, from Calcutta, who, in all other respects, was healthy. The diagnosis of a leucosarcoma had been made and agreed to by a number of pathologists, until Leber advised a bacteriological investigation. Before this could be made the woman returned from Calcutta to Paris for treatment of the other eye, that, since the enucleation of the first, had become affected. At this time small subcutaneous nodosities were observed on the cheek and elsewhere over the body. These were from the size of a pea to that of a small nut, very mobile, and the skin at many points was not sensitive. Both the corneal and subcutaneous disease were then proved by repeated bacteriological examination to be leprous. It had been decided to proceed to operative measures (peritomy and corneal incision to form a cicatricial barrier) when the reported success of chalmoogra oil (from *gynocardia odorata*), a popular remedy in the Orient, caused the authors to first make an experiment with it. The case is still under treatment, but improvement is reported,—in vision from $\frac{6}{18}$ to $\frac{6}{12}$ ($\frac{20}{60}$ to $\frac{20}{40}$), in a lessened leucoma and staphyloma of the cornea, and also in a diminution of the size of the cutaneous tubercles. The case is particularly noteworthy for ophthalmologists (1) because the ocular affection preceded, by one and one-half years, any other or general manifestation of the disease; (2) because the cornea was affected first, and not, as in previously-reported cases, after the lids or other parts; and (3) because the cornea was almost entirely attacked (in both eyes), whilst the iris, etc., remained intact. The globe of the eye was not anæsthetic. When first examined, vision of the affected eye had fallen to counting fingers at 2½ metres (8 feet). The cornea alone was affected, and only its deeper layers, the conjunctiva and Descemet's membrane, were normal. The cornea was thickened, delicately vascularized, and of a yellowish tint. Lopez's study of ocular leprosy[249 Dec.] is most praiseworthy. The Chinese are peculiarly subject to it. Out of 82 patients with the general disease, 45 showed localized lesions of the eye. This is exclusive of the lid affections which appear in most every case. Thirty-eight males were affected to 7 females. The lid affections consist of anæsthesia, tubercles, madarosis, ectropion, entropion, paralysis of the orbicularis, etc.; those of the conjunctiva, of anæsthesia, inflammation, pterygium, and tubercles. Visual loss more frequently follows invasion of the cornea, followed by anæsthesia, tubercles, and leprous keratitis (or leproma), similar to the keratitis of hereditary syphilis, but clearly distinguishable from it.

Tubercle elects the corneo-scleral margin, but may have its seat wholly on the sclerotic. The iris is attacked by tubercle, and leprous iritis is frequent. One case of aphakia and one of cataract with luxation are detailed as secondary to invasion of the ciliary region. Hemeralopia is a common functional trouble. As to treatment, isolation and protection is urged, and surgical treatment advised; cauterization of the tubercle, at least, retards its growth. Antisepsis, cleanliness, and the indicated local treatment are to be followed.

Laudman[347 May] believes that in the majority of cases of cycloplegia following *diphtheria*, the cause is a perverted state of the blood from the disease affecting the muscle, and not the nerve-centres or nerve-endings. He recommends the electric current (galvanic to promote absorption, faradic to stimulate), applied by metal concave-pointed electrodes direct to the conjunctival surface of the eyeball. Sym[36 Nov.] describes 7 cases of diphtheritic paralysis of the accommodation, and discusses the pathogenesis of the affection. He concludes that it is a toxic paralysis. Blanch,[152 Sept. 3] in the treatment of diphtheritic conjunctivitis, besides antiseptic irrigation, detachment of the false membrane, and touching the mucous surface with lemon-juice, recommends, to prevent the formation of the membrane, the application of helenin, which seems to have a special toxic action upon the diphtheritic microbe.

Boucher[178, Dec.,'88] reports a case of great amblyopia ($\frac{1}{28}$ and $\frac{1}{50}$) succeeding a case of *measles* in a young healthy man, with excellent family and personal history. The case is analogous to that of Calmeil, in which the post-mortem examination showed atrophy and sclerosis of the occipital lobe.

Seljuck[571, No.1] had 5 cases of plastic iritis (complicated in 2 instances with cyclitis) that he believes to have been of *malarial origin*. Syphilis and rheumatism were excluded. Quinine gave immediate relief. Motais[173, Jan.] reports a case of severe muco-purulent conjunctivitis and corneal ulcer in a woman of 30, who for fifteen years had suffered with malarial fever. The internal exhibition of quinine soon conquered the ocular trouble, but it returned when the patient neglected the quinine. Massive doses again gave permanent relief. A review of the literature of the subject is added. Kipp[347, July] has had 120 cases of malarial keratitis. In 90 per cent. the corneal inflammation followed a few days after the paroxysm. There was a serpiginous ulceration, with narrow prolongations. The cases last from several days to several months, with a tendency to recurrence. The treatment is especially directed against the systemic disease. Locally, nitrate of silver, 1 to 2 per cent., applied directly to the furrows, is commended, and in severe cases the actual cautery.

Thompson's case[2, Mar. 9] of temporary mono-lateral ocular paralysis, etc., was cured by iodide and mercury, though there was no syphilitic history. The patient was suffering from severe intermittent fever. The globe of the eye was immovable, anæsthetic, prominent, and the optic nerve was hyperæmic, the veins distended. A tumor of the orbit is suggested as a possible cause. Cuignet[173, Feb.] cites a number of cases of intermittent affections of the eyes cured by quinine; such are intermittent erythema of the lids, lachrymation, glaucoma, pain of corneal wound, neuralgia, and various forms of keratitis and conjunctivitis. There was usually no distinct evidence of systemic malarial affection.

Enrique Lopez y Vietia, of Havana,[1067] describes 4 cases of malarial origin, in which the hæmorrhages are believed to be directly due to changes in the vessels and the blood, as well as to an augmentation of blood-tension. They are not accompanied by retinal inflammation. They are at first radiate in form and disposed along the vessels. They ordinarily increase in extent with a febrile exacerbation, taking a rounded shape and a deeper-red hue. When numerous they form a kind of halo or circle about the papilla. The functional symptoms consist of positive scotomata accompanied sometimes by floculi in the vitreous.

From a remarkable case, as yet unreported, lately coming under my care, I can bear witness to the power of chronic ague to produce severe retinal hæmorrhage, the retinal appearances corresponding closely to those given by Lopez y Vietia.

Among the ocular affections due to *toxic substances*, Gunsberg[254 Aug.] recapitulates the reports of previous cases of transitory amblyopia in lead intoxication, and adds the details of a new case. The visual affection in all came on late in the history of lead poisoning, and lasted but a short time. The various theories that have been advanced to explain the pathology of the ocular affection are then reviewed and criticized, with the conclusion that the most probable explanation is that of uræmia, the nephritis having been primarily induced by the lead. Hutchinson[76 Jan.] advances the theory that vitreous opacities may be caused by a too long continued use of arsenic. Nuel and Leplat[171 Mar.] had 2 cases of amblyopia from bisulphide of carbon. The patients were sisters, and the symptoms were the same in both. The field was normal in extent and peripheral vision was good; there was a central scotoma, but it was very small. Under tonic treatment and rest there was a perfect re-establishment of normal vision in 6 months. The amblyopia at the time of application was finger-counting at 1 metre. Hypodermatic injections of pilocarpine were found useless in these cases. A case of amblyopia from bisulphide of carbon is reported by Becker,[190 May] in which there was great loss of visual acuity. The peripheral field was intact, but there was a large central scotoma, with complete color-blindness in the limits of the scotoma, and the quality and relative extent of the color-fields of the periphery was abnormal. The ophthalmoscope revealed no peculiarity, except that the papilla was very pale upon the temporal side. Under treatment (iodide, iron, strychnine) there was great improvement, consisting in narrowing, not eliminating, of the scotoma. The lateral half of the scotoma was greater than the median, and vision for color was more defective than that for form. The red-green sensitiveness suffered more than the blue-yellow.

Mittendorf[76, Oct.] had a patient who had for six months been taking from 40 to 60 grains (2.5 to 3 grammes) of chloral hydrate daily. There was greatly impaired vision, small central scotoma for red and green, and the papillæ "muddy." The use of chloral was stopped and strychnia administered. Improvement commenced in four days, and in three weeks vision had risen to $\frac{20}{30}$ ($\frac{6}{9}$) and the scotoma had disappeared. Edmunds and Lawford[76, Apr.] found the ophthalmoscopic changes of the eyes of a man who died from alcoholic paralysis and heart disease to consist in wide-spread haze of the retina, without hæmorrhage or localized exudation. The microscopic examination showed slight œdema of the nerve-fibre layer near the optic disk and well-marked œdema spaces in the outer granule layer, in which spaces were round and oval masses of clear homogeneous effusion. Panas,[173, Feb.] alluding to Dubois's conclusion that corneal troubles are caused by the inhalation of ethylene chloride, and that the eye becomes glaucomatous thereby, finds that the corneal affection depends upon a serous infiltration of the parenchyma, and that the corneal œdema depends upon the destruction of the endothelium, which protects the cornea from the aqueous humor. He does not find that the cornea first becomes dry before its absorption of the aqueous humor, nor that the aqueous is at first defective in quantity. Staderini and Addario[80, V.17, No.1, 2] report a case of "toad-poison" in the eye of a woman. There followed irritation and immobility of the bulb and lids, with resultant strabismus, diplopia, etc. By experiments the authors found that a 1-per-cent. collyria of the poison produced in fifteen minutes complete anæsthesia of the cornea and conjunctiva lasting four to five hours.

Wagenmann[204, B.M., H.4] gives the particulars concerning several cases of *tuberculosis of the eye*, with the results of treatment, etc. Two of the cases are especially noticeable because they came under observation during such an early stage of the process, which was localized in the conjunctiva, due to primary infection from external sources, and upon which treatment was proceeded with at once. One patient was a man, 34 years of age, in the last stages of pulmonary consumption. The ocular invasion was upon the conjunctiva close to the cornea, forming a circumscribed fleck of thickened and proliferating tissue, with the formation of a tiny abscess. Nowhere else within or without the globe was the slighest sign of similar processes. This seems to be the only reported case of like nature. Among 47 cases of bulbar conjunctival tuberculosis gathered by Amiet 2 are given as primary, but analysis shows the primary infection was in the choroid or palpebral portion of the conjunctiva. Sublimate irrigation and iodoform dusting kept the process stationary, but did not reduce it. Excision improved, but only repeated thermo-cauterization finally cured it. Another case was a man of 66 years, apparently in the best of health, but who was found to have suffered formerly from phthisis, and to be not altogether free from occasional coughs at the time. Self-infection is considered certain. It was only after oft-repeated excisions and cauterizations that the extension of the process was checked and a cure effected. In a third case the invasion of the conjunctiva is thought to have been secondary, and to have proceeded from the chronic lupus of the nose through the nasal duct, though external infection is not improbable. Two cases of local tuberculosis of the choroid, with peculiar clinical histories, are also given, and 1 of tuberculosis of the orbit.

Trousseau[173 Sept.] made four inoculations with material from the vegetation of a case of conjunctival lupus,—two in the anterior chamber and two in the corneal substance of rabbits' eyes. There were three successful and one doubtful results. The cornea showed itself more resistant than the iris, and the author thinks his conclusions point to an identity of lupus and tubercle. "Ocular tuberculosis may remain local, whence the necessity of removing a tuberculous globe only after thorough consideration, if any usefulness of the organ is still preserved." Hirschberg[178 Aug.] describes a case of tuberculous tumor of the iris in a child of 18 months. The lungs were also in an advanced state, so that enucleation as a preventive measure was useless. Valude,[274 Mar.] from 20 unsuccessful experiments to inoculate the lachrymal sac, concludes that the lachrymal fluid, either by reason of its chemical nature or by its contained bacterial organisms antagonistic to the inoculated virus, certainly prevents the development of the tubercle bacillus. Schöbl[190 Nov.,'88] gives the details of a case of tubercular disease of the choroid that he believes to have been primary in this location, extending thence to the retina and finally to the lungs. The retina was exceedingly swollen in the region of the choroidal tumor, and the case is held to be a good illustration of the migration of small tuberculous deposits out of the adventitia cells of the vessels. The interesting case succinctly described by Neese [249, v.16, p.484] is noteworthy because of the mistaken diagnosis necessitated by the facts. The patient was of middle age and healthy in every respect, except that syphilis was acknowledged, and that there was pain in one eye, with obscured vision. The media rapidly grew more opaque, and, despite the most energetic antisyphilitic treatment, the eyeball had to be enucleated. There had been no doubt that the case was one of syphilitic iridochoroiditis, until long afterward examination by bacteriological methods conclusively proved its tubercular nature. Ducamp [173, Aug.] discusses the relation of tuberculous meningitis to ocular disease, especially the ophthalmoscopic manifestations of the cerebral disease. These are either of a tuberculous nature (choroidal tubercle) or of a mechanical or inflammatory order, such as œdema, perineuritis, neuritis, and optic atrophy. The pathogenesis of the latter series of symptoms is not clear unless Deutschmann's theory be admitted as proved. According to Nettleship, if the optic nerve of one side only be affected, the meningeal lesion is on the same side if it is a true meningitis; upon the opposite side, if tuberculous. Electricity and potassium iodide are the therapeutic agents recommended.

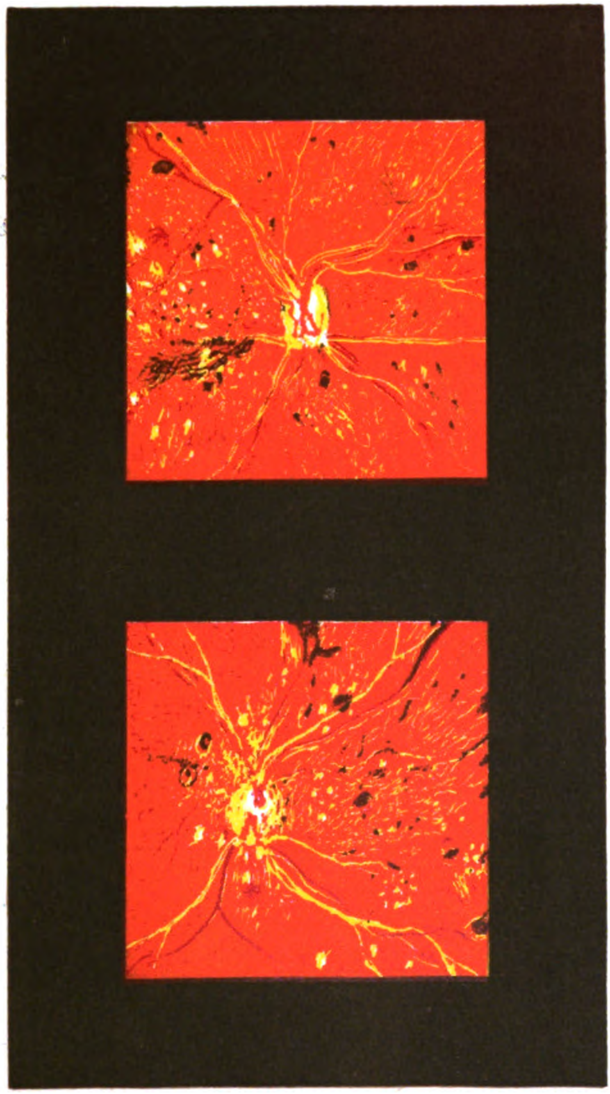
Bahr and Garnier [254, Aug.] report a case of violently-acute general *streptococcus infection*, resulting in death in about two weeks, in which the primary seat of the disease was the eye. A suppurating eye may thus lead to death, even when not enucleated, and the view that death occurring after enucleation in such a case is due to the operation requires a modified acceptance. Hanford [35, No.47,'88] had a case of complete blindness with hemiplegia and aphasia following the drainage of the pleural cavity in a case of *empyema*. The post-mortem examination showed no cerebral thrombosis or abscess, but only a generalized softening of the occipital lobe and adjacent convolutions. In explanation, arterial spasm and cardiac asthenia are adduced.

Fulton [249, June] had a case of monocular neuro-retinitis that he thinks was due to *rheumatism*. Darier [173, Sept.] renews his conviction that in rheumatic affections of the eye colchicine is a most valuable therapeutic agent. He employs it in granules of 2 milligrammes ($\frac{1}{32}$

grain) increased to 6 milligrammes ($\frac{1}{12}$ grain), or until the patient experiences intestinal troubles. Abadie, in sclerotic inflammatory affections, which he considers of rheumatic origin, prefers the salicylate of soda, either alone or with quinine. Dransart[274 Sept.] asserts that amblyopia and atrophy of the optic nerve may be of rheumatic origin by inducing an exudation within Tenon's capsule, which is followed by symptoms of compression, slight exophthalmus, amblyopia, and dilation of the retinal veins. Two forms of "tenonitis" are distinguished, the first chiefly characterized by chemosis and the other without chemosis. It is the latter form that is followed by amblyopia and optic atrophy, the chemosis serving as an outlet for the excess of morbid secretion within Tenon's capsule. The difficulty of accepting Dransart's distinction was emphasized by several members present at the meeting of the French Ophthalmological Society. Puech[274 Sept.] cites cases to show that the rheumatic diathesis may be the indirect cause of iritic inflammation at the time of inauguration of the menstrual life. Wright[59 Sept.28] believes the muscles of the eyes more subject to rheumatism than is commonly supposed. Chiralt, of Seville, Spain, our corresponding editor, reports that Santos Fernàndez had 2 cases of rheumatic tenonitis. Emmert[214 Mar.1] believes that rheumatic affections of the sclera and episcleral tissue are often mistaken for other diseases. Hutchinson[76 Jan.] traces to inherited *gout* the existence of a diffuse neuroretinitis, with filmy vitreous opacities, in a lad of 16. The affection was monocular, and the causal connection of gout is a matter of pure inference to explain the anomalous existence of such a defect in one of that age and otherwise in good health.

Darier[274 Mar.] describes 2 cases of *arthritis* following purulent ophthalmia in children,—one of 4 years, the other of 2. The joints of the right hand and the right foot, respectively, were those attacked, and in about three weeks after the acute onset of the ophthalmia.

Michaelsen[190 Dec.,'88] gives the details of a case of long continuance of hæmorrhagic *albuminuric retinitis* of about five years' duration, in which the retinal changes and visual defects continued about stationary while the albuminuria persisted. There was a history of syphilis some dozen years before the albuminuria, from which the patient had apparently entirely recovered. An interesting question arises as to the influence of this old affection upon the retinal



Retinitis Albuminurica with Pigmentary Changes. (A. Maitland Ramsey.)
Glasgow Medical Journal.

Burk & M'Fetridge. Lith. Phila.

changes. This seems probable in view of the absence of any obscuration of the refractive media and of any visible changes in the retinal vessels. It is to be remarked that accommodative difficulty was the earliest symptom of ocular complaint. The hæmorrhages were slight, widely scattered, and radiating. Lotz[353 Sept.] gives the details of an interesting case of albuminuric retinitis occurring during pregnancy, followed by detachment of the retina. Despite the introduction of abortion and the subsequent replacement of the retina, complete blindness persisted. Adamük[190 Apr.] describes a case of albuminuric hæmorrhagic retinitis occurring in a man of 46, in which vision was reduced to $\frac{20}{200}$ ($\frac{6}{60}$) and $\frac{20}{100}$ ($\frac{6}{30}$). Under systemic treatment of the nephritis there was a complete recovery within two years, both from the general disease and its ocular results. Ramsay[213 May] reports a case of albuminuric retinitis with pigmentary changes shown in the annexed chromo-lithograph. Attention is called to the fact of the visual deterioration of the periphery as well as that of the central part of the retina, the latter due to the hæmorrhages and exudations, the former to the peculiar pigmentary changes.

The excellent papers of Anderson[76 Feb. to Apr.] on ocular and nervous affections in *diabetes* and allied conditions, are worthy of study, both by the ophthalmologist and the general practitioner. The first practical lesson to be learned is that, in cases of neuritis and retinitis, where other well-understood causes are excluded, the urine should be repeatedly and persistently examined, especially for sugar. The examination of evening or after-dinner urine will often show the presence of sugar when it is absent the rest of the day. Specific gravity gives no indication of the presence or absence of sugar. It is also emphasized that before the symptoms of thirst, frequent micturition, hunger, and constipation, there is almost invariably a preceding stage of weariness and languor, loss of accommodation, a soreness across the loins and hips, intensified after a meal containing sugar or starch. There seems good grounds for believing that the significance of eczema of the vagina and pruritus of the vulva (or prepuce and glans of male) is not always understood. A case of probable diabetic conjunctivitis is described. Illustrative examples are given of the belief that gouty arthritis and diabetes mellitus are merely transformation symptoms of the same diathesis, lithæmia and diabetes being inversely cor-related and both diseases due to disorders of the hepatic functions. Associated with the symptom of languor above alluded to, there is frequently a loss of knee-jerk, or it is elicited with difficulty. This, with good pupillary action and absence of cord disease, points to the necessity of a urinalysis. An example of multiple neuritis due to diabetes is described and local neuralgias are more frequent. That diabetes may produce local paralyses is shown by one case, in which the internal and superior rectus muscles were paralyzed by a nuclear lesion. A case of hemianopsia is explained in the same way. Amblyopia suddenly occurring in diabetes presages the near outset of coma, and is apt to occur soon after commencement of the disease or of rigid treatment. Finally, the relationship of phosphaturia and diabetes is emphasized. In lesions of the nervous system from other causes, the presence of phosphaturia, normal knee-jerks, and absence of optic neuritis are of great value in differential diagnosis. Panas[274 May] concludes, from the study of the results of the use of antipyrin in 2 cases of glycosuria, that the drug has an efficacious and prompt antiglycogenic action, that it succeeds where neither diet nor treatment has been able to reduce the quantity of glycogen below a certain amount, and that its action persists even when a moderate amount of starchy foods are given. The daily dose should begin with 3 grammes (45 grains).

The excellent work of Alexander[1064] on *ocular syphilis* cannot be neglected by those wishing a thorough treatment of the subject, written as the result of a large clinical experience. Among 50,000 general cases, Alexander has had 1385 of ocular syphilis, *i.e.*, 2.76 per cent. Of this number the special parts affected were as follow: Lids and conjunctiva, 8 cases (0.57 per cent.); lachrymal apparatus, 35 (2.52); sclerotic, 3 (0.13); external muscles, 146 (10.54); pupil, 59 (4.26); cornea, 75 (5.48); iris, ciliary and choroid, 331 (23.97); retina, 107 (7.72); optic nerve, 568 (40.93); facial and third nerve, 14 (1.00); hereditary affections, 39 (2.81).

The conclusions of J. Hutchinson, Jr.,[423 July,'88] as regards syphilitic disease of the eyelids are thus summarized: 1. Late secondary and tertiary affections of the eyelids are met with most commonly in those who have suffered severely from their syphilis, especially those who have had rupial or tubercular skin eruptions or ulcers of the palate. 2. The upper lid is more liable than the lower one to be affected, though both are not infrequently involved. 3. The tertiary ulceration (gummatous) of the lids is more often met with in women than in men. 4. Not only do many cases of the latter resist specific treatment in a marked degree, but they show a strong tendency to relapse after being apparently cured. 5. As a rule, syphilitic ulcers and gummata of the eyelids are more painful than those met with on other parts of the skin.

Horstmann[249, June] gives the details of 8 cases of primary syphilitic optic neuritis, a relatively rare disease occurring mono- or bi- laterally in patients infected not a very long time,—from six months to three years. Antisyphilitic treatment is followed by improvement in the majority of cases, in some even by a perfect restoration of sight. As a rule, the visual field remains somewhat concentrically contracted, and the optic nerve becomes paler than usual. The sooner the occurrence of the neuritis after infection, the better the prognosis. Hirschberg's lecture[190, Dec.,'88] upon acquired specific retinitis is based upon more than 300 cases in twenty years' practice. He cautions against believing that the ocular disease appears only after one or two years. The first indications are small bright foci in the periphery and also the central part, and so slight that they are overlooked, but are often present within four to six months, and this is without visual deterioration. An early complaint is of persistent shimmer and light sensations. Another is inability to read by artificial or poor light. The ocular manifestations of syphilis are so general and affect so many parts that the term syphilitic panophthalmitis is proposed. Punctate opacities of the cornea are more frequent than supposed; likewise of the pupillary edge and the lens; and hazy obscurations of the vitreous are hardly ever absent.

Parisotti[171, July] gives the results of the treatment of 17 cases of ocular syphilis by the intra-muscular injection of calomel, and finds that the cure was much more speedy than with any other method of treatment, especially in iritis. Hirschberg's case[190, July] of keratitis from hereditary syphilis showed new-formed blood-vessels of the cornea and foci in the eye-ground, peripherally located. Trousseau[173, Oct.] had a case of interstitial keratitis that, despite the somewhat general belief that the affection does not arise from acquired syphilis, he thinks was of this origin. The opacities of the cornea and lens cleared up, and perfect re-instatement of vision followed antisyphilitic treatment. Seggel[326, v.4,p.4[illegible]] believes the characteristic form of the retinal symptom of cerebral syphilitic disease of the vessels consists in light deposits within the walls or in white streaking, with more or less narrowing of the lumen. In patients with these defects without impairment of vision an antisyphilitic treatment caused a disappearance of the ophthalmoscopic appearances. The cases belong to a late period of the disease.

As regards *diseases of the circulatory system*, Thoma$^{204}_{\text{v.16, No.3}}$ emphasizes the importance of a careful examination and study of the phenomena connected with the elasticity of the retinal arteries. A diminution in the elasticity of the vessel-wall is always to be found in beginning arterio-sclerosis, and if the fact of such diminution (evidenced by permanent increase of tortuosity and pulsatory movement) is clear, between the ages of 35 and 45, the danger of aneurism and other sclerotic results is to be avoided by such changes in occupation and avoidance of severe physical and mental exertion as will throw less pressure upon the arterial blood-columns. The secondary and later result of the sclerotic changes is to stimulate a new growth of connective tissue in the intima, and then the dangers from aneurism, etc., are lessened and the greater pressure is better borne. Atheromatous changes are the result of chronic disturbances of the general nutrition, though they may result from temporary disturbance, such as fevers. With the diminution of elasticity there is a coincident lengthening of the arteries, thus producing tortuosity. Vasomotor paralysis may produce the same result. The tortuosity and pulsation of the retinal vessels in neurasthenia, anæmia, and chlorosis are explained as due to diminution of the elasticity of the vessel-walls, and may co-exist with narrowed calibre. Buller$^{1034}_{\text{'88}}$ had a case of *pulsating exophthalmus*, probably due to rupture of the carotid in the cavernous sinus following severe injury of the head, that was perfectly cured by ligation of the common carotid. Eissens's case$^{254}_{\text{Dec., '88}}$ of pulsating exophthalmus is in some respects unique and of great interest. It occurred in a young woman in good health. The conclusion reached—a rupture of the ophthalmic artery—seems wholly justifiable. There was sudden and complete loss of vision, +3 tension, and extreme pulsating exophthalmus. The ligation of the common carotid gave much relief until anastomotic circulation brought back the pulsation and murmur. The ligation of the internal carotid, superior thyroid, external carotid, ascending pharyngeal, and common carotid was found necessary, followed by enucleation of the globe. There was a perfect cure of the local trouble and recovery of the general health. Bronner's patient[76, Jan.] was a farmer of 66, who had sustained an injury to his head through a fall when 1 year old, followed at once by protrusion of the right eye, which, with pulsation, had continued ever since without giving him any trouble. The case was clearly one of arterio-venous communication between the internal carotid artery and the cavernous sinus. The loud roaring heard through the stethoscope was not noticed by the patient. Raehlmann[353, June] communicates the details of 2 cases of fusiform pulsating aneurism of the central artery of the retina, with coincident sclerosis of the general vascular system. Lefort's case[70, Nov. 18,'86] is noteworthy from the fact that an arterio-venous aneurism of the carotid in the cavernous sinus following injury was cured by successive ligature of both carotids. Kipp's case[1034, '86] of double vascular exophthalmus following a blow on the head was cured by intermittent compression of the right carotid artery and the internal use of the iodide of potassium.

Raehlmann[353, Dec.] finds that when there is arterial pulsation of the retinal vessels the corpuscles are reduced in number, are smaller in size, poorer in hæmoglobin, and of smaller weight. In many cases of *anæmia* with pulsation all these conditions are present. In a pronounced case of *leucocythæmia* (DaCosta and Hershey[5, Nov.]) Gould found a noteworthy absence of the typical signs of leucæmic retinitis, and he[112, Dec.] now asks pathologists if this might not be accounted for by the fact of a chronic tobacco poisoning and the increase of connective tissue in the structures of the retina and nerve. The patient had long been an excessive smoker, and the question asked is, if the known effects, the retrobulbar neuritis, etc., from tobacco, would not in the retinal structures serve as an impediment or dike against the migration of the white corpuscles. All the typical ophthalmoscopic signs of leucæmic retinitis depend upon such white-corpuscle migration.

Hutchinson[423, Jan.] gives the details of several cases of hæmorrhage into the eye in young men who were also subject to *epistaxis*. The author thinks that in young women the menstrual function saves risk in these directions. Mayweg,[190, Nov.] in a case where one eye had been lost by *vitreous hæmorrhages*, and the remaining eye nearly destroyed, ligated the carotid and saved the eye. Gessner[190, June] reports a peculiar case of monocular enophthalmus by normal position of the body, but, when stooping, this within a minute was transformed into an exophthalmus.

Tepljaschin [1008; 254, Oct.] observed the frequent occurrence of cataract in patients who had suffered from *raphania.* The cataracts were bilateral, soft, and appeared in those from 30 to 40 years of age. The cause is sought in disturbance of the nutrition of the lens from the systemic convulsions or from vasomotor spasm.

Teillais [173, Sept.] believes that *hemeralopia* is often a result of general vascular sclerosis, which affects the vessels of the globe. The symptom has been observed in malarial amblyopia, cardiac disease, albuminuric retinitis, etc., and the author thinks that its origin may be accounted for in the same way.

Wadsworth [99, Nov. 21] had a case of a boy whose head had always been carried tipped to the right, the right shoulder lower than the left, and with convexity of the spine. In the author's opinion the *spastic torticollis* was due to a faulty position of the eyes, as it was only in such a position that binocular vision was possible. The left superior rectus tendon was divided, resulting in correction of the torticollis and vigorous growth of the boy in the year following the tenotomy.

Trousseau [173, May; 274, May] cites a number of cases illustrative of the fact that ocular disease is often caused by *nasal disease.* The association in these cases was blepharospasm and nasal polypi; blepharospasm and acute coryza; severe ophthalmic migraine and nasal polypi; monolateral mydriasis and ulceration of the nasal fossa of the same side; asthenopia and hypertrophy of the turbinated bone; and 1 case, as a type of 11 others not reported, of hypopyon, with purulent infiltration of the cornea, obstinate and relapsing under the most assiduous treatment of the ocular condition alone, but disappearing quickly when the ulcers and atrophic condition of the turbinated bones were properly treated. To bacterial agency is ascribed the production of the eye disease, and to disinfection of the nose the cure of both.

Ziem [69, No. 6] describes 4 cases of limitation of the field of vision that he considers were due to nasal affections. With the indicated treatment of the nasal disease there followed a re-instatement of the normal extent of the visual field. The explanation given of this interdependence is that of a retinal hyperæmia caused by the anastomotic connections of the vessels of the nasal mucous membrane and the ciliary plexus, inducing a disturbance of the intraocular circulation and functions of the retina. Despagnet[173, Sept.] epitomizes previous studies and reports of cases generally that illustrate the pathological relations of the nose and eyes, and lays especial stress upon the nasal origin of persistent epiphora co-existing with patency of the duct, etc. Hypertrophy of the inferior turbinated bone will always be found in such cases. Seven cases are referred to as cured by lessening the volume of these bones, principally by means of the galvano-cautery. If the lachrymation is unilateral, the operation is upon the bone of that side. In 2 cases there was deviation of the septum as a cause. Finally, the author urges that a granular rhinitis, absolutely analogous to trachoma in its bacteriological origin and contagiousness, may cause granular conjunctivitis and keratitis. Rotholz[70, Nov. 18] emphasizes the frequent relations and interdependencies of nasal and ocular affections, especially in the scrofulous ophthalmia of children, where the nasal cavities are found to share in the inflammatory conditions, and to cause relapses of the conjunctival and corneal trouble if not as carefully attended to as the disease of the eye. Ozæna is frequently the cause of chronic conjunctivitis, and diseases of the lachrymal apparatus always demand a careful attention to the nasal affection frequently their cause. Dowling[53, Oct.,'88] cites 3 cases to illustrate his conviction that nasal disease often causes reflex affections of the eyes. Chiralt, of Seville, Spain, corresponding editor, gives the clinical results of de la Peña in treating the frequently attendant rhinitis in cases of conjunctivitis. Masini[501, No. 5] emphasizes the frequency with which ozæna and other nasal diseases produce affections of the eyes.

Rampoldi[30, V. 18, No. 3] gives a review of the mutual relations, physiological and pathological, of the *ear* and eye, with clinical illustrations.

Neuschuler[173, Nov.] reports a case of long-continued *odontalgia* due to internal insufficiency of the ocular muscles and relieved by prisms. Hern[76, Oct.] reports a case of sclerotitis occurring in an otherwise healthy woman, and implicating the cornea, which had persisted for five months, when toothache led to the extraction of the carious left upper bicuspid. The pain in the eye immediately subsided, and the sclerotitis disappeared slowly within six weeks.

Hewetson[2, Nov. 10,'88] writes that, whilst all sick-headaches do not come from optic defect, he has had patients who have been "martyrs" to it, and who were also astigmatic, and in whom a complete cure has been effected by the use of cylindrical lenses, showing that when *sick-headache* and its accompanying *dyspepsia* is due to reflected irritation in a neurotic subject, from the eyes to the stomach, complete immunity from attacks of this kind may be obtained by glasses. Harper[198 Apr.] reports the case of a lady of 32, who had had a dozen or more attacks of almost continuous *vomiting*, sometimes lasting as long as five or six weeks. It was finally noticed that these attacks came on after prolonged or excessive use of the eyes at short range. There were, of course, headaches with all this. It was found that astigmatism and insufficiency of the interni existed, and when relieved of these sources of irritation the other troubles disappeared. Vanden Bergh[219 Apr.] had a case of sudden and complete blindness, lasting forty-eight hours, and following violent efforts of vomiting. Normal vision slowly returned the third day after the attack. To the irritation produced by mixed astigmatism Gould[19 Feb.9] ascribes the existence of a severe *flatulent dyspepsia* that, despite much and varied treatment, had persisted for twenty years. With correcting spectacles the violent eructations, nausea, dyspepsia, and headache immediately disappeared. The same would re-appear at once when the glasses were temporarily left off. Hutchinson,[423 Jan.] quoting Eales as to the existence of constipation in cases of intra-ocular hæmorrhage, himself adds that in his case *constipation* and epistaxis are usually concomitants of intra-ocular hæmorrhage. His patient had suffered extremely from *dyspepsia*. Nuel and Leplat[171 Mar.] found, in 6 out of 81 cases of *intestinal worms* (duodenal anchylostomum), that there were in 2 cases retinal hæmorrhages (with reduction of acuity to $\frac{5}{12}$ in 1) and in 2 others an infiltration of the papilla and retina. Another had a pale papilla and obscured fundus oculi. The hemeralopia present is explained as due to the anæmia, and the neuro-retinitis and hæmorrhages are similar to those in progressive pernicious anæmia and loss of blood.

Comini[80 V.17, Nos.1,2] has observed in chronic *disease of the lungs* a transitory or constant mydriasis, usually unilateral, and corresponding to the side of the lung most affected. There is also often photophobia and loss of accommodation.

In reference to the vexed question of the etiology of *exophthalmic goitre*, we have, as it seems, at last one certain fact that points to a solution of the mystery. White[2 Mar.30] found in a post-mortem examination numerous hæmorrhages close under the floor of the fourth ventricle, near the nucleus of the sixth nerve, and extending outward to the inner part of the restiform bodies. Though this is but a single case, yet, occupying this location, these lesions are sufficient to account for the peculiar threefold symptom-complex. The disease, it is true, was of long duration and the hæmorrhages of recent date, but White believes that the molecular and microscopical changes of the fourth ventricle that had undoubtedly preceded were the true cause of the later hæmorrhages and of the exophthalmic goitre. Charcot[100 No.34] had a case of supposed exophthalmic goitre, without either goitre or exophthalmus, but with the anxiety, tremulousness, and with decided tachycardia. Another case had no exophthalmus, but had goitre and tremulousness, and was, besides, neurasthenic. Bertoge's thesis[1041 '88] is devoted to a consideration of the fever of exophthalmic goitre, and is based upon a study of 36 cases. He finds that the peculiarities of this fever consist in its instability and its disassociation from the usual febrile symptoms. It has no constant characteristics. Especially in severe cases it is outspoken. The best means of combating it is by hydrotherapy. To explain the pathology of the disease itself the unfailing bacterium is called upon, whose development and special action upon different organs is supposed to produce the diverse forms and varying characteristics of the disease. The intra-parenchymatous injections of iodoform ether are said[173 Feb.] to have reduced the size of a goitrous neck from 39½ centimetres (15¾ inches) to 33 centimetres (13 inches), and to have relieved the patient of all symptoms of pain, difficulty of respiration, etc. In a severe case of Basedow's disease, observed by Dauscher,[113 No.7] the exophthalmus was so great that the eyeball was dislocated. Lacaille[471 May 23; 11 Oct.] obtained very remarkable results in 3 patients with exophthalmic goitre by negative electrolysis. The needle is inserted into the tumor, and a current of 6 to 10 milliampères passed for from 4 to 20 seconds.

Puech[274 Sept.] contributes an excellent clinical study of the ocular affections that may arise at the beginning of the *menstrual life*, called into action by the effort of the organism at this important period, and characterized by the peculiar diathesis of the patient, especially that of syphilis and rheumatism. The ocular lesion of hereditary syphilis may not have manifested itself prior to puberty, but is very prone to break forth with excessive malignancy at this time, with a fatal tendency to relapse or re-appearance at the next menstrual period. Two cases of fatal interstitial keratitis are described in full, that arose under the circumstances above given. Phlyctenular keratitis, pannus (?), uveitis, and particularly iritis are also said to be frequent at this epoch. The clinical details of 2 cases of iritis are given, in which the rheumatic diathesis was evident, and which show the tendency that existed of subsequent menstrual crises to relight the inflammation of the iris. Other cases described show that the deeper tissues of the eye are not exempt. These consist of examples of choroiditis with hæmorrhage, optic neuritis, disseminated choroiditis, and detachment of the retina, all arising or exaggerated at the institution of the menstrual life, and seemingly intimately connected with it. Two instances of iritis are appended, the lesion occurring in middle-aged women and coincident with menstrual difficulty or change.

Gould[19 Mar. 9] has found that, "as a rule, with irrational eye-strain, the male sex is more apt to show its ocular evidences than the female, that both sexes have the ocular signs more before than after puberty, and after this period girls and women have far more headaches, etc., than men." An explanation of this is found in the law of sexual evolution, a corollary of which would be that inflammations of the conjunctiva, lids, etc., would, in young women, operate against sexual choice, and that the natural physiological law of the return of the reflex eyeward is therefore inhibited, with the result of producing headaches, choreas, and other vicarious outlets for the derouted and inhibited return. Among the practical lessons drawn by the author are: In headache, always suspect eye-strain, and especially in women in the years between puberty and middle age. Have the refraction estimated under a mydriatic, and the co-ordination of the external ocular muscles proved by a scientific authority, *in the case of every child, before or by the age of puberty.* Hutchison[76 Jan.] says that he has seen many cases in which muscæ volitantes were attributable to want of tone of the general system induced by sexual excess, and especially by masturbation, but that generally in such cases vitreous opacities were not demonstrable with the ophthalmoscope. But he has seen a few such cases, proving the relation of cause and effect, and he cites the particulars of one such. The sight steadily failed for seventeen years, until the patient became blind. He finally became insane.

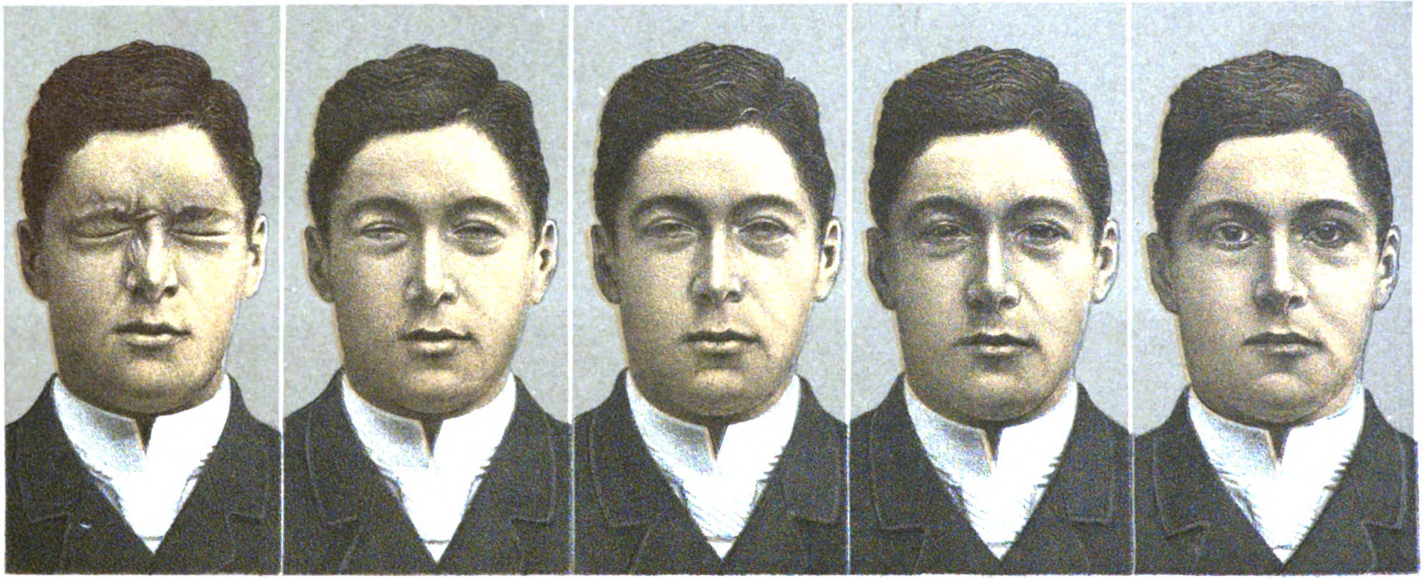
Ransohoff[353 Jan.] describes a peculiar case of corneal disturbance that seemed to have some connection with the menstrual period, and other ill-defined neuroses, and recurrent in nature. The affection is described as trophoneurotic and having close analogies to herpes corneæ. Jeaffreson[6 Ap.13] had 2 cases of amblyopia in two girls, co-existing with suppression of the menses. Woods[104 Aug.31] had a case of recurring œdema of the left upper eyelid dependent upon uterine disease. In Kollock's case[43 Jan.] blindness existed for 3 months; it was due to menstrual suppression. De Beck[53 Mar.9] chronicles 6 cases of optic neuritis whose origins were found in menstrual irregularities. The same author[53 May 11] reports a case of optic-nerve atrophy following forceps delivery.

Hutchinson,[423 Jan.] discussing the cause of intra-ocular hæmorrhage in young men, remarks that age and sex seem the most important predisponents. "In the female sex the occurrence of menstruation saves from risk in this direction." [Were the inference to obtain in any certain degree, would it not seem that in cases of delayed, suppressed, or difficult menstruation the intra-ocular hæmorrhage would be the *more* prone to occur?] Then follow the clinical particulars of several cases of spontaneous hæmorrhage into the vitreous, but in none does the supposition of the "disturbing influence of the sexual system during the early years of manhood" come out clearly or even suggestively. The inference seems, if not fanciful, at the best doubtful, and certainly not warranted by the case details. In only one case was there any sexual indulgence, and in this the distinguished author himself denies the existence of any causal connection between the two facts.

As to the *influence of age*, Hutchinson[423 Jan.] notes that hæmorrhages into the eye occur more frequently in young men. Hirschberg[190 Sept.] describes peculiarities of the fundus in the very old where visual acuity has failed. These consist in pigmentary changes, bright or whitish in the central region, dark in the periphery.

Berger's laborious and excellent work upon the *ocular complications in tabes*[254 B.19,H.3,4] is based upon a study of 109 cases, and, as a conclusion, the varied symptoms are found to be due to a lesion of the medulla oblongata. The posterior part of the nucleus of the third pair is incontestably more often affected in those cases of tabes with optic atrophy than in those without. As a result also of experiments upon animals, he shows that nystagmus follows lesion of the medulla oblongata, together with myosis or mydriasis, and that hæmorrhages, due to paralytic enlargement of certain parts of the spinal cord, are produced, as also alterations of the retinal vessels. Post-mortem study also lends support to the view. The first symptoms of tabes appear most frequently between the ages of 40 and 45 years. The cases occurring in the very young and very old are exempt from grave ocular complications. Forty-three per cent. of the patients were syphilitic. In the greater number of the syphilitics tabes begins with cerebral symptoms; in the non-syphilitics, usually with spinal symptoms. There is often a narrowing of the palpebral opening, and the shutting of the lids is difficult, the fibrillar contractions being more pronounced than in the normal. Excessive lachrymal flow is traced to a vasomotor neurosis, similar to hyperidrosis. Intra-ocular tension was subnormal in one-third of the cases. The pupillary diameters were unequal in 27.6 per cent. Mydriasis was more frequent in the preataxic and paralytic periods, myosis in the ataxic. Pupillary reactions were good in 4 cases; in 8 cases the pupil reacted to light by oscillatory movements, and the Argyll-Robertson pupil monocular in 2 cases, binocular in 32. In 21 cases the pupils were absolutely immobile. The muscle of accommodation was paralyzed in 23 cases, 15 being in the paralytic stage of the disease. Optic atrophy usually began in the preataxic period, and was more frequent in the cases with paralyses of the ocular muscles. The left eye was twice as often affected as the right. There was no relation between limitation of the field and troubles of the light and color senses. Paralysis of the muscles existed in 38 per cent., about equally divided between the syphilitics and non-syphilitics, but persisting longer in the first class. The third pair of nerves was the most frequently attacked, but the external rectus was the muscle most frequently paralyzed.

Dillmann[1065] found, among 100 cases of tabes, paralysis of the ocular muscles in 41 and optic atrophy in 42 cases. There was a preceding syphilitic history in 68 cases, and the paralyses were in the non-syphilitic as in the syphilitic. Galezowski[126, Jan.; 249, Sept.] considers, as characteristic prodromal symptoms of tabes, paralysis of accommodation, with anæsthesia of the skin about the orbit, the absence of mydriasis, with paralysis of other branches of the oculo-motor nerve. The paralysis of accommodation is always monolateral.



Thomsen's Disease. (Wising).

Revue Générale d'Ophlalmologie.

Burk & Mc Fetridge, Lith. Phila.

The paralysis of syphilis is never accompanied with anæsthesia of the skin around the orbit. Déjerine,[173 Aug.] from the examination of 100 tabetics, concludes that Benedikt's law usually holds that in these cases the progress of troubles of motility is arrested when ocular symptoms supervene. He found 2 cases of blindness occurring during the period of confirmed ataxia, but the ataxia in these continued its march without interruption. Adamük's patient[254 Aug.] was about 18 when ataxic symptoms first appeared, reaching a severe stage by the time she was 20. Atrophy of the optic nerve followed, and blindness, with paralysis of the upper and lower extremities. There was no history of syphilis; the cause was ascribed to excessive and long-continued masturbation. The post-mortem examination showed the lesion to be a typical case of disseminated sclerosis. Parinaud[173 Oct.] recognizes three clinical forms of ophthalmoplegia, the typical external variety, the tabetic, and the hysteric. He is also inclined to believe in a variety due to multiple neuritis. In reference to the influence of the suspension treatment upon the ocular affections of tabes, Eulenburg and Mendel[75 No.11] believe that it lessened the amblyopia, though this was due to optic atrophy. Howard[5 Mar.] reports a case of bilateral internal and external ophthalmoplegia, associated with tabes, bulbar paralysis, and loss of vision and hearing, with a discussion as to the pathogenesis. As to the result of suspension in tabes as regards the ocular symptoms, Galezowski[173 May] found negative results. Eulenburg and Mendel[75 No.11] had a case in which the amblyopia was lessened. Darier and Abadie[9 May 4] report excellent results.

Kunn[8 Mar.31] had a case of spastic mydriasis and neuroretinitis ending in optic atrophy, in a young man afflicted with *tetanus* of the arms and legs. The author adopts Küssmaul's theory of the central origin of tetanus.

Wising's case[870 V.51, Nos.1,2] of *Thomsen's disease* was characterized by muscular spasm upon attempted voluntary motion. In trying to open the eyes as rapidly as possible, the patient was only able to do so slowly and with effort, and by the aid of the frontalis muscle. In the same way they could not be closed as quickly as in a healthy person. After several successive attempts, the difficulty was overcome and they closed or opened normally. The annexed plate illustrates the peculiarity, two seconds representing about the time elapsing between each of the five phases shown.

Kalt[171 Jul.] had a case of double optic neuritis with acute diffuse *myelitis*. The post-mortem examination showed that in such a case of infectious myelitis the ocular structures are implicated *via* the chiasm; that the virus is carried by the vessels; that the propagation of the imflammation of the chiasm in the optic nerve pursues a peculiar course, leaving intact the peripheral fibres and following the central alone.

Sachs[5 Sept.] had a case of superior polioencephalitis or nuclear ophthalmoplegia, with intercurrent *poliomyelitis*, proving a close relationship between the gray matter at the floor of the third and fourth ventricles and the anterior gray horns of the spinal cord.

Uhthoff[1068] examined 100 cases of *multiple sclerosis*, and found paralysis of the ocular muscles in 17 per cent. (abducens, 6; motor oculi, 3; convergence, 3; ophthalmoplegia externa, 2). The paralyses were of central origin, appeared later, and were often bilateral. Nystagmus occurred in 12 per cent. and nystagmus-like motions in 46 per cent. The differential diagnosis from tabetic paralyses consists in the fact that the latter are associated with reflex pupillary immobility and without nystagmus, whilst in the paralyses from multiple sclerosis the pupil is seldom affected and nystagmus is frequent.

Heddaeus[254 June] gives a *résumé* of the methods of testing the *pupillary reactions*, and, as to the *significance* of the latter, finds that disturbances of the mobility of the pupils are always due to anomalies of the centrifugal fibres, while disturbances of the reflex sensibility are always due to anomalies of the centripetal fibres. When in doubt as to which eye is the one pathologically affected, it is always the one the less active. He concludes that anisocoria is not due to anomalies of the centripetal fibres.

The results of von Hippel's experimental studies of *neuroparalytic keratitis* upon animals,[204 v.35, No.3] combined with a thorough critical review of the literature of the subject, have convinced him that the theories ascribing the affection to the influence of micro-organisms, or to the exclusive agency of traumatism, are disproved. The trophic origin is also negatived by the fact that anatomical studies disprove the existence of trophic fibres within the trigeminus. The origin of the affection is simply due to the xerotic condition of the cornea, evaporation and dryness resulting naturally in a non-sensitive eye. The apparent exceptions probably depend upon a hypersecretion of tears or other conditions less favorable to desiccation. Subnormal resistance to injuries does not exist, and a moist atmosphere hinders the appearance of the morbid process.

Kalt[73, Mar. 2], had a case of progressive facial hemiatrophy in a child of 11, with disseminated choroiditis of the eye of the same side, abnormal smallness of the globe, compound myopic astigmatism, fluid vitreous, etc. The cause of the ocular lesions is ascribed to the common origin of the *hemiatrophy of the face*, trophic disturbances, and changes in the trigeminus. A case of hypertrophy of the lid, with facial hemiatrophy of the same side, is explained in the same way by Estor.[92, Oct.,'88]

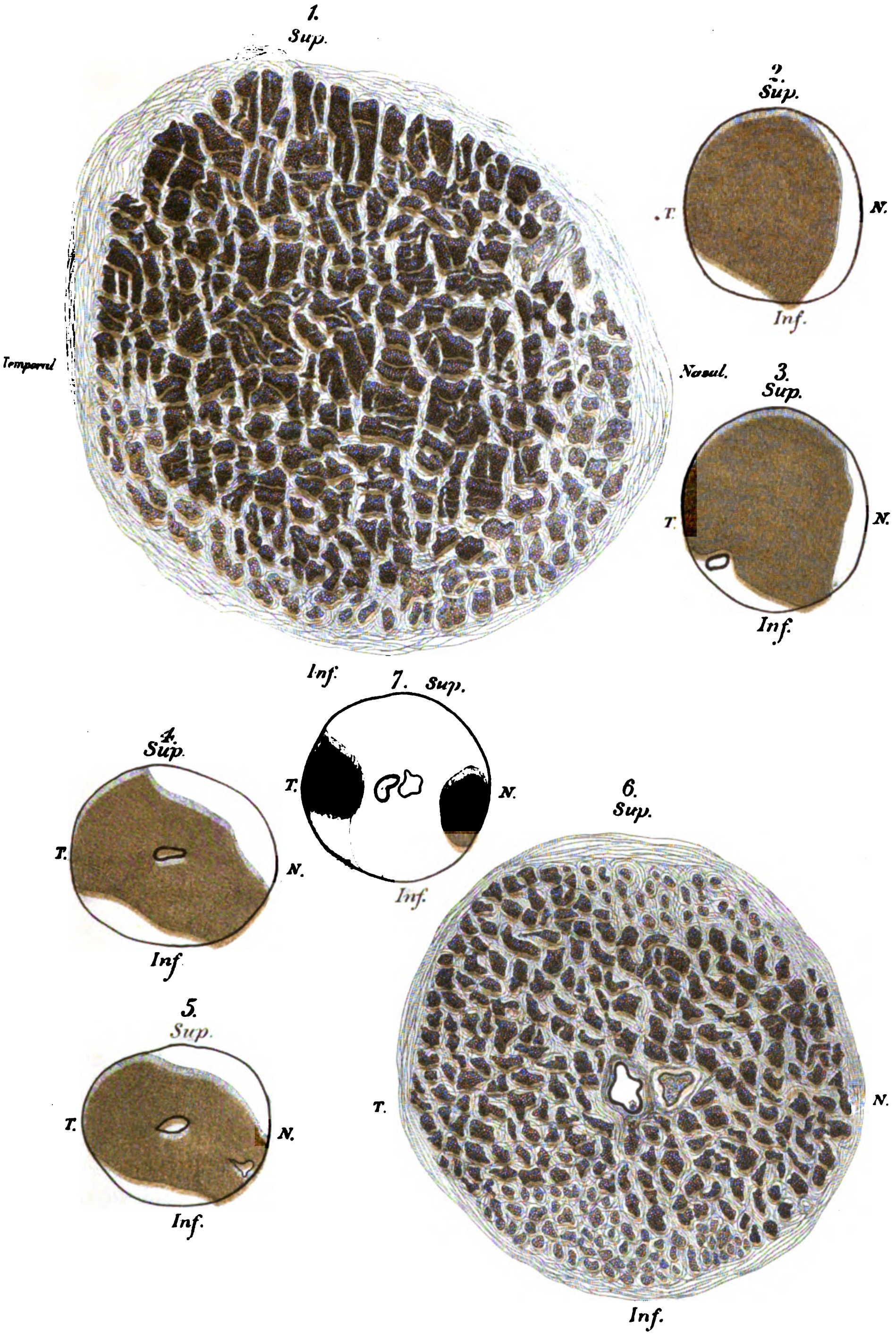
The third and last part of Mauthner's treatise[1069] upon *paralysis of the ocular muscles* is occupied especially with diagnosis, prognosis, and treatment. It is the most complete work of the kind in existence, and will not be neglected by the profession. Benzler[495, No.7] describes a case of paralysis of the convergence suddenly coming on in a musician while playing the hautboy. The pupils reacted normally and distant vision was perfect, but there was paralysis of the accommodation. The author would have us believe that convex glasses did not increase the visual acuity. He thinks there was a hæmorrhagic lesion at the centre of convergence. Westphal,[368] Kojewnikoff,[73] Eichhorst,[214, July 16] and Mittendorf[242] report cases of nuclear paralyses of the ocular muscles, and discuss the pathology, localization, etc. Howard[5, Mar.] had a complicated case of chronic progressive ophthalmoplegia, externa and interna; chronic labioglossal paralysis, and tabes dorsalis, combined with bilateral motor paralysis of the fifth nerve; loss of two of the special senses, vision and audition; and impairment of common sensation in some of the branches of the sensory portion of the fifth nerve on both sides. Cheney[99, Sept.5] describes a case of the very rare uncomplicated progressive ophthalmoplegia externa. In a case of unilateral progressive paralysis, Adamkiewicz[84, No.1] found complete paralysis of the abducens and superior oblique and partial paralysis of the third nerve. Despite the failure of the lachrymal secretion there were no neuro-paralytic symptoms, and vision was preserved intact. Manz[4, Aug.28] thinks his case of recurrent or periodic ocular paralysis was due to circulatory and vasomotor disturbances. Vissering[34, Oct.8] adds to his report an intelligent discussion as to the pathology of this rare and mysterious affection. As regards the ocular spmptoms of general paresis, Oliver[347 July] found not only local changes, but that the sensory motor disturbances were the peripheral expressions of one of the many indices of gradual loss of neural power. The study is based on 20 cases in the second stage of the disease. There was lowered sensory response, paresis of the muscles, fundus changes, showing wear and tear of an abused and irritated organ.

To those especially interested in the value of *eye symptoms in the localization of cerebral disease*, no more trustworthy and compact account can be recommended than the Bowman lecture of Swanzy.[2 Nov.17,'88] It is to be hoped that the lecture may be expanded into a volume. It is a careful and systematic *résumé* of the latest results of investigators upon this somewhat difficult but highly important subject.

Bull[347 Aug.] reports a case of double choked disk due to *intra-cranial tumor*,—a gliosarcoma of the corpora quadrigemina. Blindness ensued three months after the diagnosis of the papillitis. Nothnagel[650 No.9] also describes a like case. Van Merris's case, a gliosarcoma the size of an orange in the right sphenoidal lobe, was noteworthy for the absence of other symptoms except papillitis and headache. Hutchinson's case[423 Jan.] of large, soft, rapidly-growing basal tumor is noteworthy from the fact that there was great defect of sight without papillitis. The perineural sheath of the nerve was infiltrated with small cells and delicate connective tissue. The tumor had started four to five months prior to death. Calderons's case[171 July] of double optic neuritis was caused by a hydatid cyst in the left lateral ventricle.

Rath's inaugural dissertation[204 B.34,H.4] summarizes the results of the published cases of tumor of the pituitary body, numbering 36, and adds the details of 2 cases not previously recorded. From the study it appears that such tumors cannot *intra vitem* be located. Tumors of the neighboring region cause frontal headache extending to the orbits, temporal hemianopsia, later optic atrophy, strabismus, and weakness of the legs, with mental hebetude. There may be diabetes, either mellitus or insipidus. Saundby[2 V.2,p.1294,'88] also reports a case of pituitary tumor.

Freund[368 B.30,H.31] designates as *optic aphasia* a condition of extreme difficulty in designating things by their names, and believes it necessary to distinguish this from psychical blindness. In Siemerling's case[368 H.1] the author thinks, from experiments upon himself, that



Cortical Hemianopsia with secondary Degeneration of the optic nerve. (Schmidt-Rimpler).
Archiv für Augenheilkunde.

Burk & McFetridge, Lith. Phila.

the psychic blindness was due to diminution of visual acuity and color-blindness. Recognition of the object in both instances was perfect when touch was allowed, and the aphasic symptoms disappeared as the vision improved.

Sutphen[347, July] reports a case of double purulent choroiditis resulting from *meningitis*, and ending in blindness and progressive atrophy of both eyes. Browne[423, Jan.] writes of the association of central choroiditis in children with slight cerebral symptoms. Night-terrors, nausea and vomiting, anorexia, and digestive derangements are particularly noted. To the author it seems probable that the cerebral and ocular affections are both due to transient and slight *inflammations of the meninges.* I would suggest that ametropia is the cause of both, eye-strain setting up the train of reflex symptoms so well known in the young (intense nervousness, night-terrors, gastric and other disturbances), and the abnormal stimulus, long-continued, of an imperfect retinal image inducing the choroido-retinal lesion. D'Oench[254, V.19, H.3] reports 2 cases of vertical nystagmus. Holger Mygind, of Copenhagen, corresponding editor, describes 2 cases of unilateral nystagmus; one, a child (200 movements a minute), ended in a spontaneous cure.

Schmidt-Rimpler's case[254, B.19, H.3] of cortical *hemianopsia* with secondary degeneration of the optic nerve shows some noteworthy differences as regards the position of the various fibre-bundles supplying the different parts of the retina. The annexed plate shows the relative location of the atrophic and sound strands, the atrophic being the lighter-shaded. Fig. 1 is a section made at the optic foramen; Fig. 7, from the region of the lamina cribrosa. The other figures in order show sections made between the two points. The lesions date from an injury to the right side of the occipital lobe in its upper portion, and this was followed by left-sided hemianopsia. The left eye had been lost in childhood. The hemianopsia of the right eye was therefore more noticeable, the patient at once complaining of visual trouble immediately upon the return of consciousness after the accident. The skull was broken, and the prolapsed brain-substance excised "in masses as thick as the finger." The temporal field was normal in extent, and, as usual, the dividing line did not pass exactly through the macula. The hemianopsia continued unchanged until death, from tuberculosis, five years later. D. B. St. John[76, Oct.] had a case of hemianopsia with doubtful atrophy of the nerves. The nasal half of the fields were blurred. The right eye finally became blind and the vision of the left greatly diminished. The cerebral symptoms were those of pressure. Anti-syphilitic and antimalarial treatment proved powerless. Lannegrace[171 Mar.] contributes a study on homonymous hemianopsia and crossed amblyopia.

Bruns[75 Nos.5,6] describes 7 cases of *traumatic neuroses*, in which there was limitation of the field in one or both eyes, sometimes for colors alone; amblyopia without ophthalmoscopic explanation, and numerous other defects and complaints of a functional character. Anisocoria and diplopia were found only when there were organic lesions of the cortex.

Nuel and Leplat's case[171 Mar.] of amblyopia following a peculiar traumatism is interesting, as showing the influence of an abnormal condition or absence of the scalp upon the functions of the cortex. The patient was a girl whose scalp had been torn off by the hair having been caught in machinery. During the granulation and grafting processes that followed there were particularly noticed great diminution of the tactile and visual sensation. Vision $= \frac{5}{18}$ ($\frac{15}{60}$), the fields greatly contracted, but color-vision normal in the field preserved. Blindness followed, but the pupils still reacted to light. There was a long and slow return of vision to $\frac{5}{18}$ ($\frac{15}{60}$) and $\frac{5}{12}$ ($\frac{15}{40}$), with normal fields. The preservation of pupillary reaction and the chromatic sense point to the superficial implication of the cortex in the inflammatory processes of the scalp. At one time there was hemianopsia from the unequal implication of the two optical centres in the occipital lobe. Bernhardt's patient[4 No.1] suffered from a railroad accident; the pupils were unequal; there was paresis of the left external rectus, good vision, and no limitation of the field. In another patient, after contusion of the left arm, there was a monoplegia of the hand and a limitation of the visual field.

Ranney's detailed[59 June 22] exhibit of 50 cases of *headache and neuralgia* due to eye-strain is a commendable effort to bring before the general profession a "realizing sense" of the fact that eye-strain is the most prolific source of these affections. To "graduated tenotomy" is, perhaps, ascribed too great a rôle as a therapeutic measure, but the chief contention undoubtedly obtains. Marlow,[76 Dec.] from a careful study of 215 cases, thus summarizes his tables: (1) that headaches are frequently the result of ametropia and heterophoria; (2) that ametropia is a more *common* factor in the production of headaches than heterophoria; (3) that heterophoria is more *certain* to produce headache than ametropia; (4) that astigmatism is the most common and powerful refractive factor in the production of headaches, and, of the different forms of astigmatism, compound hypermetropic astigmatism is the most important in this regard; (5) that hyperphoria, either simple or complicated with eso- or exo- phoria, is a common form of heterophoria; (6) that hyperphoria is decidedly more certain to produce headache than any other form of heterophoria or ametropia; (7) that a combination of hyperphoria with astigmatism is the most powerful cause of ocular headache.

Culver[347 Jun] fortifies his incontrovertible position that headache is largely of ocular origin by quotations from leading ophthalmic surgeons, and adds the clinical details of 10 severe cases relieved by the application of proper glasses. To ophthalmologists, of course, the fact is a matter of every-day observation, but even at this date many general practitioners need to have the lesson brought home to them again and again. De Schweinitz[112 May] reports 6 cases of headache associated with persistent apparitions or other peculiar and strange visual phenomena. In all but 1 case the refraction was hyperopic or astigmatic, often also with insufficiency. In a review of similar cases reference is made to the suggestive fact that the visions have been known to appear just before the development of hemianopsia, and in that part of the field afterward becoming permanently dark. Such phenomena are explained as temporary congestions in the highest visual centres, the function of which is later destroyed.

Berbez[152 Jan] writes of *migraine accompagnée* that this type is almost always found to have followed fatigue of the eyes, and often co-exists with other affections, such as scintillating scotoma, hemianopsia, contracted field, etc. Aphasic symptoms are also frequently met with, and also hemiparesis, usually of the right side. The affection points to localized visions of the cortex or meninges. In a case of severe and long-continued neuralgic pain in an eye blind from glaucoma, and instituting symptoms of sympathetic inflammation in the other eye, Rampoldi[30 p.56,'88] finally gave relief and entire cure by continued doses of antipyrin, 3 grammes (45 grains) a day. Chibret[171 July] has seen 5 cases of keratitis and 2 of iritis that he thinks primarily due to trophoneurotic affection of the ophthalmic branch of the fifth. Grandclément advised hypodermatic injections of antipyrin.

Among *sundry neuroses*, Harper[198 Apr.] reports the details of 2 cases of obscure but varied mental troubles due to astigmatic and hyperopic errors, that disappeared at once upon their correction. Hewetson[2 Nov.10,'88] cites illustrative cases of insomnia and general symptoms usually called hysteria, such as tenderness of the spine and skin generally, great nervousness, malaise, etc., that were distinctly traceable to irritational eye-strain. Gould[19 Feb.9] describes a case of extreme *rapidity of the cardiac action* (130 beats per minute) that had resisted other therapeutic attempts for several months (and which had come on after prolonged reading at night), and that was followed by loss of flesh, health, digestion, etc. With the correction of the existing astigmatism, there was a speedy re-instatement of normal conditions. Webster[76 Dec.,'88] reports 2 cases of *choreä* notably benefited, though not cured, by tenotomy for the correction of "heterophoria." Gould[19 Feb.9] reports a case of chorea in a girl that, without amelioration, had been treated for two years at a hospital for nervous diseases with large and long-continued doses of arsenic. This treatment was discontinued upon ordering spectacles, and within three weeks after the correction of her compound hyperopic astigmatism her chorea entirely disappeared (not returning in six months), and with it likewise her headache, dizziness, violent outbursts of temper, etc. Wiglesworth and Bickerton[47 Jan.] furnish further valuable records to show the influence of refraction errors in the production of *epilepsy*. From the nature of circumstances, the results of the therapeutical attempts with chronic hospital epileptics were not of a convincing nature. If it is difficult accurately to estimate the ametropia in such cases, it is yet more so to get such patients to wear the correcting glasses. Moreover, it is evident that in these chronic cases long-standing functional disease has become, if not organic, at least of such confirmed habit that, the cause being removed, the disease will probably continue. As the authors rightly emphasize, this failure by no means argues against the causative agency of the refractive error. The large proportion of ametropes among the epileptics examined certainly demands some explanation.

In their examinations, the authors considered as emmetropic all those with a hyperopia of 1 dioptre or less. This, indeed, renders the statistics all the more striking and trustworthy, but, in my opinion, is too great a concession to the conservative instinct. Is it not true that in the neurotic one-half of 1 dioptre is sufficient to induce severe irritational eye-strain? Of 103 epileptics, 48 are tabulated as showing refractive errors of a more or less decided character. Of the 55 remaining "emmetropes," we wish the numbers had been given with a hyperopia of ½ to 1 dioptre. In the more acute cases the results seem to warrant a more enthusiastic statement than is given. Two patients had suffered for 14 and 3½ years, respectively; these were not influenced by the glasses. Another case was entirely relieved for 4 months, but the glasses were then laid aside and the fits returned. Another patient had, after the application of spectacles, only 6 fits in 8 months. Out of the 9 cases experimented upon, there were 4 positive cures, 1 each remaining free from attacks for 10 months, 11 months, 12 months, and 29 months, respectively. It is to be noted that the authors have apparently left out of consideration the influence or existence of inco-ordination of the ocular muscles as a source of peripheral irritation.

Webster[75, Dec.,'88] operated on 4 epileptics by tenotomy for the correction of "heterophoria." None were cured, but 1 had a temporary suspension of the fits, and another believed they were favorably modified. Hösslin[34, No. 6] finds that in epileptics, as well as in other cases of neuroses, such as hysteria, chorea, etc., the field of vision is abnormal, mostly dyschromatopsic in character,—not, however, constant. Pechdo[8, Feb. 21] had a case in which epileptic seizures ceased after the enucleation of a globe which was in a state of chronic irritability.

Griffith,[249, Sept.] classifying the phenomena of functional eye symptoms in *hysteria* and allied conditions, makes these groups: 1. Hysterical blindness, mostly unilateral. 2. Unilateral amblyopia with achromatopsia and hemianæsthesia. 3. The same as above, without hemianæsthesia. 4. Blepharospasm. 5. Conjugate deviation of both eyes. 6. Neurasthenic asthenopia.

Parinaud[173, Oct.] reports 73 cases of ocular affections in hysterical patients. Hysterical amblyopia is characterized by limitation of the visual field, dyschromatopsia, monocular polyopia, micromegalopsia, lessened accommodation, etc. Of the 73 patients it is to be noted that 30 were males. Hysterical motor affections of the eyes are usually of the nature of associated paralyses. Harlan[76, Oct.] reports 2 cases of hysterical blindness, one in a boy said to have been blind for eighteen months, and cured by repeated applications of electricity. Another case was in a man who thought he had been blind for ten years. He had come prepared to have the eye enucleated. A simple experiment proved to the patient that his vision was as good in the "blind" eye as in the other, much to his surprise and delight. The study of Binet upon hysterical anæsthesia[8, Dec.17,'88] is of interest as regards the inter-relations of the cerebral centres and visual function. In Marlow's case[1, Feb.9] of hysterical blindness in the male the cure was by "a shock,—namely, flooding the retinæ with light by atropine." Williams succeeded by etherization.[109, July]

Jeaffreson[6, Apr.13] describes 2 cases which he designates hysterical amblyopia, dissenting entirely from the idea that the more proper term would be "feigned amaurosis." "In the one, the will is in abeyance and the body is abandoned to the extraneous influences of strong impressions. In the other, the will is all-powerful and acting in the direction desired for a given and definite purpose." A case of hysterical amblyopia lasting several days is reported by Féré[173, Aug.] to have followed a short visit by the lady to a store lit by the electric light! Parinaud[173, July] had a patient that complained of blindness in one eye, and yet was proved to possess binocular vision. In explanation, the author thinks that different cerebral centres exist for peripheral and for central vision, and that in binocular vision both eyes are in relation with a single centre, either the right or left, whilst in monocular vision the retina is in relation with the opposite hemisphere. Hösslin[34, No.6] found that in 12 hysterical patients there was concentric narrowing of the field of vision both for white and colors, or abnormalism of the usual order of the color-fields. From a study of the fields of vision in 8 cases of hysterical anæsthesia, Mitchell and de Schweinitz[5, Nov.] conclude that changes in color-perception are far less often found in this country than in Europe. Sciammana and Parisotti[484, v.14,No.3] report that in passing into *the hypnotic sleep* there occurs an increase in the refraction of the eye of 1 or 2 dioptres. There is also a contraction of the retinal arteries and a hyperæsthesia of the cornea and conjunctiva. Where the suggestion given the subject was that a certain color was white, an enlargement of the visual field for this color was noted, and the visual field for white was narrowed when it was ordered that the white square was of another color. This narrowing was most marked for blue. In complete catalepsy the cornea was insensitive.

REFRACTION, ETC.

Hess[204, v.265, No.2] disputes Frick's theory of tne synchronous *unequal accommodation* of the two eyes, and seems to prove conclusively the error of Frick's position and experiments. Straub, as reported by Van Rijnberk,[730, Mar.2] corresponding editor, concludes that the *development of the emmetropic eye* out of the hyperopic child's eye is by means of an increase of the curvature of the lens. Feilchenfeld[201, v.26, No.1] concludes that in the young *the refraction is progressive*, especially in myopia, and to the extent of 1 to 2.5 and even 4.5 D. There are occasional cases of stationary and even decreasing refraction. Different changes often take place in the two eyes, and the loss of an eye does not modify the processes. In adults the refraction generally does not change, decrease being more frequent than increase, cataract formation often coinciding with the increase of the refraction, though the two facts stand in no exact relation to each other.

Of 4000 eyes examined under a mydriatic by Jackson,[76, Oct.] the refraction was H. + Ah. in 40 per cent.; H. in 31; M. + Am., 9; Ah. + Am., 6½; Ah., 6; M., 4; Am., 2; Em., 1½. Of the hyperopes, 63 per cent. showed astigmation; of the myopes, 76.

A needed work is sought to be initiated in Smith's "Eye-Sight and School-Work,"[76, Feb.] a printed sheet prepared for school-rooms, and containing instructions, both to pupil and teacher, as regards the avoidance of ocular injury by study. A similar aim suggested Abbott's "Test-Types for the Uses of School-Teachers" (London: Packard & Curry). Maddox's plan for the education of short- and weak- sighted children (J. W. Sargeant, Peterborough, England) consists in the recommendation of devices for instructing near-sighted pupils without so much application to the text-book on their part.

Maklakoff, of Moscow, President of the Russian Ophthalmological Society, corresponding editor, in reporting upon the examination of school-children as regards the changes in refraction consequent upon unhygienic school-desks, light, etc., calls needed attention to the error inherent and necessarily resulting from the fact that the examinations are usually made with the test-lenses without paralysis of the accommodation. He confesses that all his own statistics are false, as well as those of most others, from this method of proceeding.

Cotter[347, July] advises the constant use of a strong mydriatic in estimating ametropia and generally the prescription of the full correction. Theobald[347, Aug.] commends the oleate of veratria (10 per cent.), applied to the forehead once a day for three or four days prior to refracting, instead of other mydriatics, on account of its superiority in calming asymmetrical spasm. Lippincott's excellent and suggestive article on *binocular metamorphopsia*[249, Mar.] will repay perusal by the practical ophthalmologist. Distortion of objects by the correction of hyperopic or astigmatic anisometropia is undoubtedly largely due to psychical habit, and the period of primary unpleasantness must not throw one off his guard. (Compare Culbertson[61, Sept., '87] and Savage.[347, Sept.])

Mittendorf[1034, '86] describes a number of cases of what he terms *symptomatic myopia.* It is a temporary condition produced by certain diseases of the eye causing an advancement of the lens toward the cornea, an increase of the contents of the vitreous chamber, or a swelling of the lens. Motais[14, June 18] examined the family history, etc., of 330 young myopes, and concludes that an hereditary influence was certain in 216, or in 65 per cent. This hereditary form appears earlier, advances more rapidly, is higher in degree, and has more frequent complications than the acquired type. The father more frequently passes his defect to the daughter, the mother to the son.

Schmidt-Rimpler,[204, v.35, No.1] from measurements of 1299 orbits of eyes,—722 emmetropes and hyperopes, and 577 myopes,—finds not only no support for Stilling's theory that the *size of the orbit* governs the production of myopia, but his figures show the orbital index of the myopes even greater than in the other class. Myopia is caused by excessive near-work. Baer[1071] comes to a similar conclusion, also, from experimental studies. Cohen[249, Sept.] supports Stilling's hypothesis with the results of the examination of 334 orbits.

Chauvel,[173, Mar.] in reviewing Martin's study of myopia and its relations to astigmatism, advances the following propositions: 1. Corneal astigmatism is more frequent and of a higher degree among hypermetropes than among myopes. 2. There is no relation between the degree of astigmatism and the extent of the papilla-crescent, together with the degree of myopia. 3. In the astigmatism from leucoma most patients are hyperopic or emmetropic, and not myopic. 4. The axes of the astigmatism have no influence upon the situation of the choroidal staphyloma. Nienimin[704, No. 1] finds that the measurement of myopia shows it to be less when effected with both eyes instead of one, whilst in hyperopia the reverse is the case. Schneller[204, V. 35, No. 1] traces to pressure of the muscles upon the globe the production of changes, both at the anterior and posterior pole of the eye. In the latter the sclerotic becomes thinned with permanent denutrition and distention. Randall[9, Feb. 9] concludes that the reflex *Bogenstreif* (curvilinear reflection) of Weiss, is rare and not the cause or forerunner of myopia. Motais[171, July] concludes, as to the pathogenesis of myopia, that the dragging upon the choroid by too long continued accommodation modifies the nutrition of the sclerotic and diminishes its resistance. The compressive action of the extrinsic muscles and capsule, then, produces myopic lengthening. Kesler, according to Van Rijnberk, of Amsterdam, corresponding editor, proposes the terms *papilla falcata* and *papilla annulata* (or, more simply, *falx* and *annulus*) for the more common *conus* and *choroidal atrophy.*

Macnamara[2, Feb. 16] believes that, in the case of simple *hyperopia* of young people, the teaching of Donders that the spectacle should be worn constantly is to be dissented from. He bases this dissent upon the dogma (for so it must as yet be called) that a very large proportion of such cases progress from hyperopia to emmetropia, and that by the constant use of spectacles this change "may possibly be delayed, if not prevented."

There are few practical ophthalmologists who will not learn much from the excellent little book of Maddox[1072] on the "Clinical Use of Prisms," etc.

Landolt, of Paris, corresponding editor, has devised a simple test-apparatus intended for cases where vision is less than $\frac{1}{10}$. The edges of the white space appear under an angle of one minute when placed at a distance of 50 metres. If the C is distinguished from the O at 5 metres, vision is equal to $\frac{1}{10}$, etc. Burnett[1034, [illegible]] showed to the American Ophthalmological Society a series of models designed for class demonstration of the method by which cylindrical lenses refract light. The models were made by Charles F. Prentice, of New York, in whose valuable book is also shown the working out of these questions mathematically.[1073 '98] Gould[249 Dec.] again recommends the plan of manufacturing bifocal lenses advised by him last year, and gives hints as to the limitations of their use, etc. He also describes a method of obviating the light-reflex from the edge of spectacle-lenses—an annoying thing to many patients—by beveling the lens-edge at such an angle that it shall form a plane with a line drawn from the pupil. A new device for measuring astigmatism is also praised for ease, quickness, and accuracy of determination.

Javal[171 July] commends the so-called *toric* or *periscopic lenses*, as obviating the inconvenience of the necessity of turning the head so exactly to bring the axis of vision in identity with the optical centre of the lens. Starr[347 Apr.] describes a new *optometer*, designed for rapidly measuring simple hyperopia or myopia. Chibret[274 May] has constructed a *trial frame*, whose object is to give the three measurements required by the optician to construct a properly-adjusted and fitting pair of spectacles. These three are the distance between the pupils, that between the temples, and the height of the bridge of the nose. The *shape* of the bridge, an equally important factor, and also the length of the temple-piece, is omitted in this place. If the author's criticisms of the French opticians are merited, our American members of the guild might teach their French cousins some needed lessons. No system can take the place of mechanical skill in the optician.

Randall[76 May] describes a useful model which he has devised to demonstrate before classes the relations of accommodation and convergence. Whitney, of Tokio, corresponding editor, sends us samples of his commendable record-chart of refraction cases.

G. M. G.

OTOLOGY.

By CHAS. S. TURNBULL, M.D., Ph.D.,

ASSISTED BY

ARTHUR AMES BLISS, A.M., M.D.,

PHILADELPHIA.

THE drift of opinion, as shown by the otological literature of the year, seems to be in favor of more active surgical interference in conditions which were formerly regarded as almost hopeless. Although very little that is really new in operative procedure has been devised, old and rarely-used methods have been revived. This is shown in the more aggressive treatment of plastic catarrh of the middle ear and in attempts at removal of useless or necrosed tissue in cases suffering from purulent otitis. There is an increased and general recognition of the important relation which post-nasal disease bears to almost every form of aural inflammation. With this broader view of the origin of aural disease comes also the acknowledgment of the vital importance of the cure of pathological conditions within the nares, oral cavity, and pharynx.

Certain hypotheses in bacteriology have been more firmly established by later investigations.

Active attention, as shown by a number of valuable papers, has been devoted to the subject of mastoid disease and its relation to purulent otitis and cerebral abscess.

EXTERNAL EAR.

Hyperostosis of the External Auditory Canal.—Thomas R. Pooley,$\frac{1}{\text{Mar.}}$, states that the treatment of such growths has been unsatisfactory because of their ivory-like consistence, their situation, and the intensity of the inflammation which often follows their removal. If circumscribed and pedunculated, they are usually situated at the junction of the cartilaginous and bony meatus; or they may be diffuse hyperplasiæ of dense structure. The methods recommended for their removal are: 1. The gouge.

2. Perforation of the growth by files, drills, and similar tools attached to a dental engine. 3. Galvano-cautery. 4. A chain-saw. The author, in the case reported, adopted a modification of Matthewson's method. Instead of a dental engine he employed the electro-osteotome invented by Milton J. Roberts, of New York. The tool used was a hollow trephine, $\frac{3}{16}$ inch (12 millimetres) in diameter; this was soon changed for a small "burr." The patient, a man 35 years of age, suffered from closure of the right external auditory meatus by two bony tumors arising from the osseous structure near the cartilaginous wall. The membrana tympani could scarcely be seen. Hearing, for watch, was 1 inch (2.5 centimetres); for voice, 30 feet (9 metres). There were sensations of weight and of pain in the ear and side of face. Iodide of potassium in drachm (4 grammes) doses, daily, had failed to produce any benefit.

In operating, the integument over the growth was first carefully removed. By means of a small "burr," the tumor was cut down almost flush with surface of external auditory canal. There was much hæmorrhage, the cleansing of which caused delay. The operation lasted two hours. The auditory canal was now about normal in width. Dressing consisted of antiseptic hydronaphthol gauze. This was removed after four days, and, on account of considerable purulent discharge, the canal was left free. Healing progressed slowly, there being great and persistent swelling. A small perforation which had been made through the drum-head closed in about three weeks and the wounds in the canal cicatrized. The last notes made of the case report the canal to be almost normal in size throughout its entire length. Hearing, for the voice, is normal, and the watch can be heard at 2 inches. There remains only a slight tinnitus, which is daily becoming less. The advantages of this method over that of Matthewson are: Better control of the instrument, its whole weight being sustained by a spring-coil, or rubber, connected to the arm of an adjustable crane, and less danger of leaving ragged and uneven edges in the track of the cut. Tubes inserted into the canal after operation, to prevent closure of the walls by swelling, should not be used. Simple treatment, as by instillation of hot water, is preferable, the author believing that the presence of tubes tends to increase the inflammation.

Jacquemart[175, Jan.] believes that traumatism or a tendency to herpetic inflammation of the skin are the conditions most frequently productive of exostoses of the external auditory canal. The causes are most active in individuals of a gouty or scrofulous diathesis. The exciting cause is often a slight excoriation upon the skin of the external auditory canal. Inflammation, beginning at such a point, on account of the anatomical structure of the part, soon attacks the periosteum and bone. For their removal Jacquemart has usually employed the electro-cautery.

Neuroses.—John N. Mackenzie[5 Feb.] describes a neurosis of the aural apparatus closely allied to coryza sympathetica. The case resembles what might be termed "hay fever of the ear." The affection began suddenly in the summer of 1866, during a sojourn by the patient, a woman, among the mountains of Virginia. Since this time the symptoms have returned regularly each year, in June or September, continuing for one month and suddenly disappearing. During the winter she is entirely free from any aural or throat disease. The attack is characterized by suddenly-beginning, intolerable itching of the external auditory canal, attended with similar sensations along the course of the Eustachian tubes, at its mouth, and upon the corresponding side of the throat. Swelling of the skin of the external auditory canal soon follows, and the part is extremely sensitive to the touch, but is not affected by the condition of the atmosphere. Symptoms of middle-ear inflammation soon appear and Eustachian salpingitis is clearly manifested. These symptoms are all relieved by a suddenly-occurring and profuse discharge from the external auditory canal. Occasionally there have been furuncles within the canal. No relief for this condition has been obtained from any form of treatment, but the patient is free from all her symptoms while residing in a district where "hay-fever" patients find benefit. The affection is always limited to one side, one ear being affected one summer and the other the next, or the same ear alone may suffer for several consecutive summers.

Otitis Externa.—For the treatment of acute diffuse external otitis, when the secretion is excessive, Miot and Baratoux[35 Jan. 16] recommend the use of the following formulæ. The solutions are used per syringe: ℞ Sodii bicarb., 5 parts; aquæ destil., 1000 r
℞ Acidi borac., 1 part; aquæ destil., 35 parts. ℞ Hyded by
bichloridi, 1 part; aquæ destil., 200 parts. drum of

L. Guranowski[885, No. 7, '89; 828, Apr.] reports a case of an intense external otitis occurring in a man 32 years of age. The attack had lasted for three days, during which time the canal had become blocked by a mass of false membrane. This was removed by means of forceps, and represented a cast of the external auditory canal. The canal was greatly swollen, and there was also a purulent discharge from the middle ear. This latter condition had been of long duration. Upon microscopic examination the false membrane showed the presence of fibrin, with lymphoid cells, micrococci, and a small number of bacilli. Cultures revealed the presence of the bacillus pyocyaneus, which seems to have much to do with the causation of otitis externa, according to Gruber. Treatment consisted of syringing the canal with boracic-acid solution and a dressing of tampons of cotton-wool soaked in carbol-glycerin (1 to 10). Later, powdered boracic acid was insufflated once daily, and in the course of ten days the ear healed.

Furuncles.—The writers upon this subject seem to generally agree that the staphylococcus pyogenes is the agent which produces this form of inflammation. Schimmelbusch[828, Feb.] believes that they are forced into the follicles of the skin usually by mechanical irritation. This theory of a local infection accounts for persistent succession of furuncles in frequent cases, for their tendency to infect surrounding parts, and also for their not uncommon occurrence in otorrhœa.

Loewenberg, quoted by Lacoarret,[188, May 18] states that the condition is due to the presence of the staphylococcus albus and staphylococcus aureus and citreus. In one case only did he find the three forms together present. His treatment is antiseptic. Instillations are made into the ear of saturated solutions of boracic acid in alcohol: ℞ Acid. borac. (in fine powder), 20 grammes (308 grains); alcohol (absolute), 100 grammes (3½ ounces). He incises the furuncle when necessary. For the relief of pain he uses an alcoholic solution of cocaine (5 to 10 per cent.). Treatment must be continued for a variable length of time, and the patient's general condition also calls for careful attention. The author believes that furuncles often appear after the removal as' impactions of cerumen. For this reason he applies a boracic-that thvash before removing such masses: ℞ acid. borac., 3 Jacq (45 grains); glycerinæ et aq. destil., āā 50 grammes

(1½ ounces). Twice daily, for one or two days before the final syringing for removal of the impaction, this solution is instilled into the affected ear.

R. Cholewa,[116] obtains good results in the treatment of furuncles from the use of solutions of menthol. He finds, from a series of experiments, that a 10-per-cent. solution of menthol is sufficient to stop the development of staphylococci. For clinical use he recommends a solution of 20 per cent. A wad of cotton, moistened in this solution, is to be placed in the auditory canal so as to cover the diseased parts. The pain caused by the agent is not severe and soon ceases. These wads should be renewed once in twenty-four hours and the treatment continued until the affection is overcome. This result, it is stated, will be effected in a few days.

Foreign Bodies.—The ordinary methods of examination failing to locate the position of a ball of small calibre lodged in the ear of the patient, Dudon[188, Dec. 9] made use of a Trouvé electric stylet. This immediately indicated that the ball was lodged in the middle ear of the right side. The author lays stress upon the importance of removing, without delay, foreign bodies lodged within the temporal bone. He believes that the Trouvé stylet facilitates the finding and removal of balls fixed in this part.

Cozzolino[37, Mar.] reports the case of a child, 3½ years of age, brought to the Naples Hospital for the removal of a carobe-seed, wedged far back in the external auditory canal in contact with the drum. Finding the ordinary means of extraction to be ineffectual, Cozzolino employed the aural syringe, used for washing out the external auditory canal, as an aspirator. The body was thus drawn loose from its position. Great care was necessary to avoid injuring the surrounding parts.

Trifiletti, corresponding editor, Naples, Italy, reports that, for the removal of foreign bodies from the ear, Corradi recommends the use of oil in preference to water, as the foreign substance is less likely to increase in size by absorption of fluid when oil is used than is sometimes the case when water is employed.

MEMBRANA TYMPANI.

Artificial Membranæ Tympani.—Celluloid is recommended by Katz,[69, July 11] as having advantages over the ordinary artificial drum of cotton or rubber. The latter will often effect improvement in hearing, but the rubber drums (Toynbee-Lucae) almost invariably cause irritation in the external canal. The celluloid drums are made from a scale of celluloid left after evaporation of an ethereal solution of this material. This thin scale is cut to the necessary size and shape. To its centre a thin roll of cotton is attached by a drop of celluloid solution. This serves as a handle. The small plate is then moistened in carbolized oil, and is applied over the perforation in the membrana tympani. The author has always removed such drums within twenty-four hours after application, but believes that, in cases where no otorrhœa exists, they could safely be allowed to remain much longer.

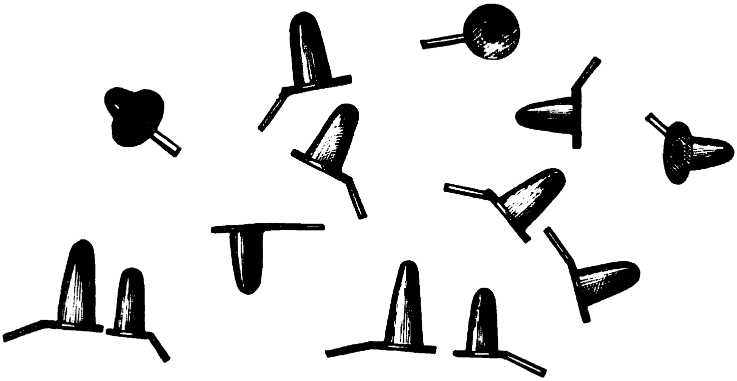


FIG. 1.
(*British Medical Journal.*)

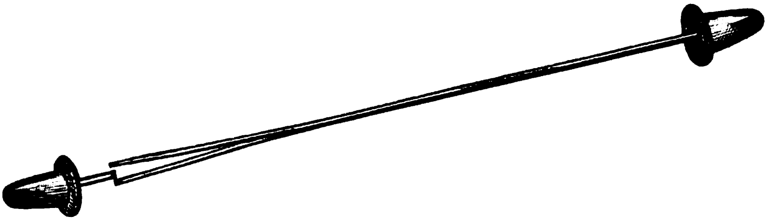


FIG. 2.
(*British Medical Journal.*)

John Ward Cousins$^{2}_{\text{Sept. 28}}$ has invented an *entirely new artificial drum*, by the use of which he has obtained excellent results. He believes that, for whatever condition an artificial drum is employed, the Eustachian tube must be unobstructed and the naso-pharynx in fairly healthy condition. According to him, the essential qualities of a good artificial drum-head are: 1. Hearing for distance and for conversation should be decidedly improved by its use. 2. The drum must be so constructed that it can be applied or removed readily by the patient himself. 3. It must be extremely light and delicate in structure. 4. It must be efficient as a protector to the injured organ and a screen for maintaining the moisture of the exposed tympanic cavity. 5. It should be capable of adapting itself to the meatus, so as not to become displaced. 6. It should be a convenient vehicle for the application of local astringent and deodorizing agents. 7. It should be inexpensive.

Fig. 1 illustrates the new drum-head. It is made of compressed cotton-fibre, swollen by prolonged immersion and saturated in antiseptic oil and ether. According to size, its weight varies from $\frac{1}{6}$ to $\frac{1}{4}$ grain (10 to 16 milligrammes).

Fig. 2 represents the instrument by which it is introduced, and Fig. 3 shows the drum-head in position. It is not necessary to place the crown of the little hat-shaped instrument upon the perforation or in contact with the remnants of the tympanic membrane. The rim of the "hat" should be in gentle contact with the walls of the canal, and its handle, a small ribbon, should rest just behind the tragus, so that it can be secured readily when removal is necessary. Before application, the inventor carefully cleanses the meatus with a boracic-acid wash and completely deodorizes the ear. Patients are instructed how to do this, as well as how to apply and remove the artificial drum. The instrument cannot be used when otorrhœa is excessive, and, when discharges exist, great care must be observed that the instrument does not prevent their escape. The cup-like end of the drum-head is sometimes used as a receptacle for antiseptic drugs. The author recommends the use of a fresh drum-head every day. He claims to have obtained very satisfactory results, and, at a demonstration of the instrument

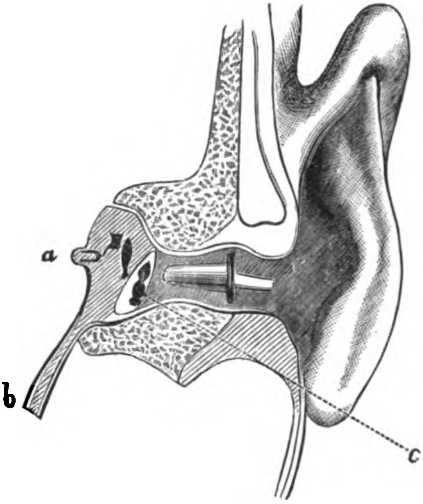


FIG. 3.
(*British Medical Journal.*)

at the Leed's Infirmary, made before the members of the British Medical Association, much satisfaction was expressed as to the usefulness of this invention.

Laurence Turnbull, of Philadelphia,[66 Dec.,'88] concludes an article on the *value of artificial membranæ tympani*, with the following statements: 1. That such aids are of importance to the health of the ear, by preventing dryness and the general danger to the hearing from the want of the protecting power of the natural membrane. 2. A certain degree of hearing is possible without the membrana tympani, but perfect hearing is impossible. In the various agencies which had been employed they had not only the power of protecting and preventing the drying effect of the air, but also of excluding injurious foreign agents from the middle ear. The author recommended the use of pellets of sublimate-cotton or a dossil of sublimate-gauze. While otorrhœa continued, the ear should be cleansed by use of bichloride solution, 1 part to 4000. The pellets are placed in position with ordinary tweezers. The author had discarded all forms of apparatus which had any metallic spring, handle, etc., having found them always irritating and injurious.

Rupture.—W. R. H. Stewart[6 Mar.23] reports *5 cases of ruptured membranæ tympani from boxing the ears.* Case 1. Child, age 9 years; pain and complete deafness after the blow; rent extends across lower part of drum-head under the handle of the malleus. Treatment: 4 leeches in front of tragus, hot fomentations of boracic-acid solution. Result: Healing of membrane. Case 2. Woman, age 33 years; complete deafness resulted immediately from the blow; lesion similar to that of the previous case, and the treatment was also the same, but the edges of the rent were touched several times with a solution of silver nitrate. Case 3. Man, age 60 years; received the injury during boyhood, from which time he has been deaf, and has suffered repeatedly from very offensive discharge from the affected ear. Of the membrana tympani, only a mere outer ring remains; the ossicles have disappeared, and there is a chronic inflammation of the mucous membrane of the tympanum. Treatment: Instillations of solution of boracic acid in alcohol. Result: A cessation of the discharge; no change in hearing. Case 4. Man, 44 years old; immediately after the blow he experienced deafness, pain, and faintness; has since been deaf, and has lost the sense of taste upon the corresponding side of the tongue. Treatment: Leeches and hot fomentations. Result: Disappearance of pain and gradual healing of the perforation, while the power of taste and hearing is returning. Case 5. Woman, age 22 years. During childhood the drum-head was punctured with a hair-pin. This accident caused pain, deafness, and loss of taste upon the corresponding side of the tongue. Under treatment this perforation healed; taste and hearing are returning.

Perforation.—Satisfactory results are reported by Berthold,[136, June 15] from the operation of covering the perforation with a piece of human skin. After stopping the discharge and cleansing the ear, a piece of skin is carefully adjusted within the edges of the perforations, much as a watch-glass is set in its frame. Hearing is not diminished by this procedure, but is rather improved. The corneas of rabbits have been used for the same purpose, but with uncertain success. For small perforations, Berthold uses the skin surrounding an egg within the shell. By the irritation of its presence an inflammation is produced which results in the final closure of the perforation.

RUPTURED MEMBRANÆ TYMPANI FROM EAR-BOXING.
(*Lancet.*)

New Methods of Detecting Small Perforations.—Where the usual methods for detecting small perforations are insufficient, Pins[113, Dec. 30, '88] states that a small whistle, as used for dolls and other toys, can be fitted into the external auditory meatus. Air forced through the Eustachian tube will thus be made manifest, even though the perforations be very small. To overcome certain objections, based upon acoustic laws, to a short tube and strong blast of air, it is best to attach such whistles to the end of a rubber tube, 20 to 25 centimetres (8 to 10 inches) in length. A slight blast of air will then produce the note. Another method is to fill the external auditory canal, having first made it thoroughly dry, with boracic acid, magnesia usta, lycopodium, or some other harmless, light powder. Inflation by Politzer's or Valsalva's methods, or through the Eustachian catheter, will then force the powder out of the meatus. A third and less objectionable method is performed by holding a clear piece of glass in front of and close to the aural speculum. While examining the canal through this glass under the light of a head-mirror, the patient is directed to practice Valsalva's method of inflation. If perforations exist the glass will, for a moment, become dimmed by condensation of the patient's breath upon its surface.

Membrana Tympani in Phthisis.—At a meeting of the Boston Society for Medical Improvement, Morse$^{99}_{\text{Dec.20,'88}}$ showed three casts of the membrana tympani, consisting of the whole dermoid coat of the membrana, which he had removed entire from the ears of two phthisical patients. They exhibited the results of one form of inflammation which may occur in the ears, usually in patients suffering from phthisis. This fact was referred to by Green during the discussion of the case, but he was unable to describe the exact etiology of the condition. He was inclined to include such cases under the head of desquamative inflammation; nor did he think that it resulted from a specific inflammation, although most generally occurring in phthisical subjects.

MIDDLE EAR.

Micro-Organisms in Acute Otitis.—Baratoux$^{290}_{\text{Apr.30}}$ on this subject might stand as the general expression of opinion in regard to the relation of microbes to aural disease. The work of different examiners into this subject is reviewed. From these and his own experiments he concludes (1) that the streptococcus pyogenes and the staphylococcus are the micro-organisms most frequently found in acute otitis; (2) that all microbes found in the discharges accompanying otitis are also to be found in the nasal chambers and pharynx; (3) that in the majority of cases the pathogenic agents come from the nose and pharynx, and enter the tympani through the Eustachian tubes, this same mode of invasion occuring in typhus, measles, diphtheria, scarlatina, and typhoid fever, although the microbes invading the middle ear in these maladies need not of necessity be the peculiar microbe of each disease in question; the secretions of the mouth and the imperfect deglutition, owing to pain, allow the microbes to multiply rapidly, while the patient's power of resistance diminishes in consequence of the general state of his system; (4) as a consequence of the foregoing, the great importance of making careful examinations of the nose and throat in all patients suffering from these diseases, and the necessity of using antiseptic measures for destroying the microbes already in the naso-pharynx or of lessening their activity.

Zaufal$^{88}_{\text{Nos.4,15}}$ has very fairly demonstrated that inflammation of the middle ear can result from the presence of the pneumo-bacillus discovered by Friedländer and the diplococcus of Weichselbaum and Fränkel. He acknowledges the importance of the streptococcus pyogenes in the etiology of such conditions, its origin in the naso-pharynx, and its entrance into the tympanum by the Eustachian tubes. Moos$^{328}_{\text{Apr.}}$ has confirmed these opinions and also the assertion that the streptococcus pyogenes is always found in the most serious cases, namely, in those attended with mastoiditis or with caries. This fact, if true, makes the detection of its presence an important factor in considering the origin and prognosis of a case of purulent otitis.

Gradenigo, assisted by Bordoni-Uffreduzzi,$^{37}_{\text{Sept.}}$ has made a careful study of the micro-organisms found in 8 cases of otorrhœa. Four of these cases were acute, the others chronic. The literature of this subject shows 14 cases in which the diplococcus pneumoniæ of Fränkel was found. The authors add 3 more,—all acute cases,—making 17 in all. This micro-organism seems to be associated with acute conditions. In chronic cases the streptococcus pyogenes albus and aureus prevail, and the authors, for the first time, add Proteus vulgaris to this list, this latter microbe being found in 3 cases, in all of which the discharge was fetid. It existed alone in 1 case; in 2 others it was associated with the streptococcus.

Our corresponding editor, A. Gouguenheim, of Paris, states that Netter also finds the staphylococcus pyogenes and the streptococcus pyogenes to be the prevailing micro-organisms in otorrhœa. They were present in the sero-purulent discharge found in the tympanic cavity in 20 autopsies made upon children varying in age from 9 days to 2 years. The pneumococcus was also present. He has searched in vain for the tubercular bacillus in the tympanum. The tubercular bacillus, however, has been found by Borbone$^{624}_{\text{Nov.}}$ (report of corresponding editor, Trifiletti, Naples) in the purulent discharges from the ears of patients suffering from consumption.

S. Moos[66 Mar.] considers in detail the pathological conditions of each part of the aural apparatus in measles. He finds general thrombosis as the result of degenerative changes in the endothelium of blood-vessels, causing fatty and colloid degeneration of the histological structures. The micro-organism which he discovers should be ranked among the cocci. It differs morphologically from that described by Manfredi[54 No. 22, '88] by the constancy of the *round* form, the spherical growth, Manfredi describing his own as oblong, with rounded or obtuse ends. These micro-organisms group themselves most generally in chains. For this reason the author considers them streptococci. "But it is very doubtful whether it (the streptococcus) may be considered as the specific micro-organism of measles." It is also found accompanying diphtheria. It should be considered as "an accidental and not a specific micro-organism."

Scarlatinous Otitis.—According to Charles H. May,[27 Apr.] the lesions resulting from this condition are usually most extensive, destructive, difficult to arrest, and cause in young subjects a large percentage of deaf-mutism. Reports show that among 5613 deaf-mutes examined, 572, or 10.18 per cent., of the cases resulted from scarlatina. The symptoms of this condition do not differ from those always found in otitis. Very young children, often being unable to indicate the seat of pain, should, upon the appearance of the systemic symptoms, be at once examined for this complication. Otitis should be guarded against in all cases of scarlatina, and especially in patients in whom the inflammation of the fauces is intense. In such, careful attention should be directed to the condition of the throat and naso-pharynx. As soon as the early symptoms connected with middle-ear inflammation are noted, a conveniently-shaped ice-bag should be applied behind the auricle and to the temporo-maxillary region, a layer of flannel being first placed over the skin. Hot applications and the instillation of hot salt solution, 1 drachm to 1 pint (4 grammes to ½ litre), must be employed where cold cannot be well borne. Iodine, painted over the skin of the mastoid region, is also of service. Local depletion is of benefit, effected by the true or artificial leech applied over mastoid area or in front of tragus. Antipyrin and opiates are recommended. Congestion will usually yield to these measures, but in more severe cases it may become necessary to incise the drum-head. If the effusion does not escape after this procedure, Politzerization, either with or without the Eustachian catheter, should be employed, the naso-pharynx being previously washed with a warm salt solution (1 drachm to 1 pint). It is also advised to wash away discharges from the auditory canal, using this solution, when these are offensive and profuse. This is effected by means of a fountain syringe, or an ordinary syringe used with the least possible amount of pressure. The opening into the membrana tympani should be made in its posterior-inferior quadrant, the incision being large and extending downward and forward. Powdered boracic acid should not be used in this stage of the affection, nor should astringent agents be employed until all acute symptoms have passed away. In the diphtheritic type of scarlatinous otitis, where great destruction is apt to occur, the author recommends the methods employed by Burckhardt-Merian. Apply a 10-per-cent. solution of salicylic acid in alcohol to the diphtheritic patches, reaching the tympanum through the perforations in the drum-head. Cotton, upon a fine holder, is the agent for making these applications. The naso-pharynx is to be similarly treated. False membrane is to be removed from the tympanum by forceps or curettes, and a weak salicylic-acid solution (1 to 2 drachms [4 to 8 grammes] of a 10-per-cent. alcoholic solution in 3⅓ ounces [100 grammes]) of water is syringed several times daily into the external auditory canal. A solution twice the strength is used for gargling the throat. The nares are douched with salt water (¾ of 1-per-cent. solution), salicylic acid being gradually added to this wash in the proportion of 2 or 3 tablespoonfuls of the 10-per-cent. alcoholic solution to 1 litre of the salt solution. Where the nervous apparatus of the ear has become involved, as a consequence of scarlatina, the drug recommended by Politzer, Rosengarten, Wolf, and others, is pilocarpine. For from four to six weeks daily hypodermic injections of ⅙ to ½ grain (10 to 30 milligrammes) of this remedy are to be used. The object of its employment is to cause absorption of inflammatory products by the increased exudation into the aural cavities, produced by this drug's influence. The general practitioner will find useful hints for treatment in this article up to the point where the operation of paracentesis is described. From that point patients, as a rule, must be dealt with by a specialist. Fortunately, if the treatment advised for the early stages of this complication is followed, the more difficult treatment will not often be required.

Eitelberg$^{158}_{\text{v.10,H.1,'88}}$ reports *a case of pure myringitis.* Examination of this patient, a child, revealed a normal external auditory canal, but the drum-head was intensely red and swollen. The membrane of the other ear presented the results of a former attack of purulent otitis media. There was great pain in the affected ear, and the patient had slight fever. Paracentesis was performed, but no discharge could afterward be forced into the canal by inflation with Politzer's air-bag. There was, however, considerable hæmorrhage. This local depletion caused a total disappearance of all the symptoms.

Anomalies of the Chorda Tympani and Plexus Tympanicus, caused by Inflammation, with Discharge from the Middle Ear.—Godskesen, according to Holger Mygind, corresponding editor, having examined 75 cases of suppuration of the middle ear, gives the following conclusions, based upon former investigations of his own:—

Suppuration of the middle ear is often accompanied by anomalies of taste, secretion of saliva, and sensibility of the tongue. The anomalies of taste are most frequently situated on the anterior part of the tongue, and are due to a lesion of the anastomosis between the plexus tympanicus and facial nerve of the chorda tympani, or especially of the nerve of Jacobson;—rarely in the posterior part of the tongue or on the soft palate; if present in this location, they must be considered as due to reflex paresis caused by irritation of Jacobson's nerve. It is highly probable that all taste nerve-fibres going to the anterior part of the tongue belong to the stem of the glosso-pharyngeal nerve, which they leave as ramus tympanicus in order to reach the lingual nerve, following two courses, viz., the facial nerve and chorda tympanica, on the one side, and the nervus petrosus superficialis minor and the otic ganglion, on the other side. The glosso-pharyngeal nerve gives fibres of taste to the soft palate, but does not send any fibres of secretion to the parotid gland. These latter come from the facial nerve and leave it with the anastomosis to the plexus tympanicus. All papillæ clavatæ on the anterior part of the tongue seem to receive fibres of four different sorts for the distinction of acid, sweet, bitter, and salt. It seems as if a minor part of the sensitive nerves of the anterior part of the tongue originate from the chorda tympani, and, in some cases, also from Jacobson's nerve. The trophic nerves of the tongue do not seem to originate from the nerves in the tympanic cavity. Lesions of the nerves of the tympanic cavity are, as a rule, not accompanied by prominent subjective symptoms, and are of very little practical importance.

Otorrhœa.—Eitelberg ${}^{158}_{v.10,H.1,'88}$ refers to *catarrh of the Eustachian tube as being the cause of deafness in the cases of many inmates of institutes for deaf-mutes.* With them the true seat of disease has not been early recognized; one acute attack succeeds another; nasal and post-nasal catarrh is allowed to develop and continue its course unchecked. As a consequence, catarrh of the middle ear is established with firm retraction of the drum-head, anchylosis of the ossicular joints, pressure of the plate of the stapes into the oval window, where adhesions soon bind it firmly and cause a constant intra-labyrinthine pressure. The sound-conducting and sound-perceiving apparatus are both altered from their normal state, and, in a short time, deafness results. This process is often gradual, but in very young children one cannot judge how rapidly it may advance, and deafness follows even before the child has learned to speak. The process is especially rapid in the case of rachitic children. Treatment, to be effective, must be directed to the nasal and naso-pharyngeal catarrh, specific treatment being used when the need is indicated. Politzerization must be steadily and perseveringly employed, the Eustachian catheter being used when required. In the case of children under 1 year of age the catheter must not be used, as the narrow limits of space and the shortness and width of the Eustachian tube make it possible to produce too much pressure by means of air forced in directly. This might result in the production of an atrophied and relaxed membrane. The early symptoms of purulent inflammation of the middle ear are to be met by the use of leeches over the mastoid region and cool dressings over the affected ear. Ice should never be applied to young children. As soon as effusion into the tympanic cavity occurs, paracentesis should be performed. The discharges must be removed by syringing warm water into the external auditory canal and the use of Politzer's inflation-bag.

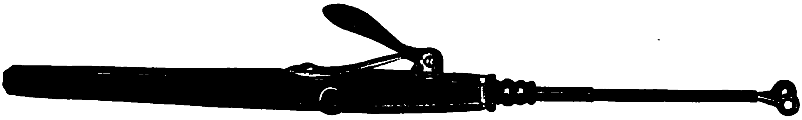
This should be followed by the instillation of a 4-per-cent. boracic-acid solution into the external canal. If the discharge still continues after the lapse of twelve or fourteen days, it is recommended to use solutions of lead acetate. Two to 5 drops of a saturated solution are to be added to ½ fluidounce (15 cubic centimetres) of water. Antiseptic solutions of carbolic acid and of corrosive chloride should be freely used in chronic cases, when the discharges are offensive, for very young children, the carbolic-acid solution being of the strength of 1 to 1½ per cent. Creolin is useful as a disinfectant, and has power to lessen secretion and prevent the growth of granulations. Among drugs used in the form of powder, boracic acid still holds the leading place.

Loewe,[41 Jan.31] has devised *a new dressing in cases of otorrhœa*, in favor of which he gives strong testimony, and yet which would appear to have some disadvantage to which he does not refer, an important one being its apparent tendency to favor plastic adhesion between the drum-head and the posterior tympanic wall. The author refers to the unsatisfactory attempts made to form aseptic and antiseptic dressings in cases of otorrhœa, and gives a new method of plugging the ear-passages which aims to constantly remove the discharges and thus favor rapid healing. After thoroughly cleansing the entire external canal, and having inflated with Politzer's bag, Loewe inserts small bits of sublimated cotton, carrying them, under full illumination from the head-mirror, back against the drum-head. One piece after another is thus placed, being carefully fitted in, much as a dentist would fill a cavity in a tooth, so that the closely-fitting plug exerts a light, even pressure against the drum-head and the canal-walls. Larger pieces are then added until the canal is filled. A large pledget is then placed in the concha and the dressing is retained by a bandage. This dressing must be renewed daily, each time the ear being first inflated by Politzer's method and the canal thoroughly cleansed. When dealing with large perforations, care must be taken that the bits of cotton are made of sufficient size to prevent all possibility of their passing through the opening into the tympanic cavity. The mechanism of this method is: (1) the part of the dressing nearest the drum-head absorbs (sucks out) moisture from the tympanic cavity; (2) the central part draws the moisture still farther forward; while (3) the external layer serves as an evaporating surface, and thus tends to constantly maintain the process of imbibition. It is claimed that this dressing removes entirely all danger from retention of secretions, hastens the process of healing, and shortens the course of treatment. It is acknowledged that, for a time, it causes slight deafness; that it may sometimes irritate the skin of the canal or the drum-head; that it requires about twenty minutes for a proper application of the cotton; and that, unless properly applied and the external layer prevented from becoming wet from external moisture, it is useless or even harmful. The author claims to have obtained good results, especially in new cases and those in which the perforation is in the inferior segments of the drum-head.

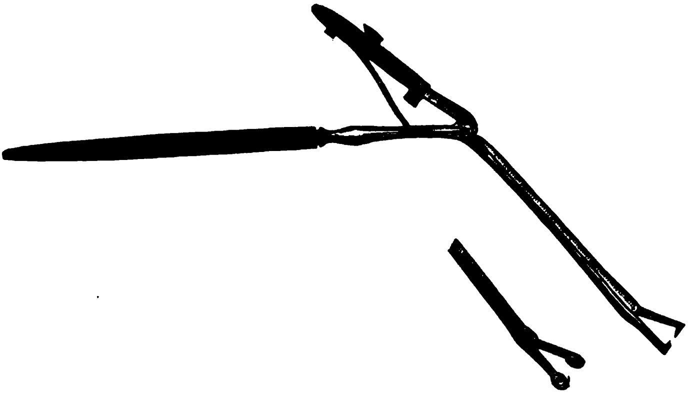
Charles H. Burnett[9, Nov. 2] reports a *case of chronic purulent discharge from the ear, with deafness, cured by excision of the membrana tympani and malleus.* The patient had suffered for seven years from purulent otitis, and numerous polypi had been removed from the affected ear. There was a large perforation in the flaccid membrane, the membrana vibrans being intact. The usual treatment for such a condition had been faithfully tried, and, under these procedures, the discharge became less in amount, "*but the ear did not get well.*" An operation for the removal of the drum-membrane and malleus was then performed, with most satisfactory results. "The steps of the excision consisted in: 1. An incision behind the short process with a slender, curved blade. 2. Through this initial incision a round-pointed blade, curved in the plane of its broad surface, was introduced, and, being kept close to the manubrium below the insertion of the tensor tympani, was pressed upward against the latter, and the tendon thus severed. 3. Then a straight blade, with round, blunt point, was used to cut around the membrana tympani in the annulus tympanicus, thus entirely detaching it and severing the hammer-ligaments at the neck of the bone. 4. Instead of forceps, the polypus snare was now used to seize the malleus, being passed around the manubrium, and the malleus and the membrana tympani were removed from the ear. The slight hæmorrhage was controlled by mopping the fundus of the ear with a 4-per-cent. solution of cocaine muriate. During the operation the fundus of the ear was mopped frequently with a 2½-per-cent. solution of carbolic acid. After the operation the meatus of the canal was lightly tamponed with cotton, sprinkled with iodoform, and left in place for twenty-four hours." The case progressed favorably. In two weeks it was noted that all discharge had ceased. The patient had before been totally deaf in the affected ear. She could now hear loud words at about the distance of 4 feet (1.2 metres). Three weeks after the operation the mucous membrane of the "attic" had become pale and dry, and whispered speech could be heard at a distance of 6 inches (15 centimetres). About five weeks later it was noted "that a new membrane had formed from the segment of Rivinus, the region of the membrana flaccida, down to the promontory. There was no discharge;" hearing, 2 or 3 feet (60 or 90 centimetres) for whispered words. Three weeks later—about eleven weeks since the operation—hearing had increased to 9 feet (2.74 metres) for isolated words in ordinary conversational tone. The new membrane was movable, as shown by a pneumatic speculum. The author explains the improvement in hearing by the supposition that the necrosed malleus prevented sound-vibrations from reaching the other ossicles, which were healthy. The new membrane did, in part, the work of a normal drum-head, and thus the ossicles, being more freely moved, gradually loosened adhesions which had formed between the stapes foot-plate and the edges of the oval window. Later notes of this case report the hearing to have increased to 12 feet (3.65 metres) for ordinary speech. The author compares this brilliant result with the best that could have been obtained from the usual methods of treatment. These might—*and might not*—have stopped the discharge, but the hearing could not have improved to any appreciable extent.

Six cases of otorrhœa are reported by Reinhard and Ludewig[328, Feb. 27] in which this *operation of excision of the malleus* was performed. In 4 cases the membrana flaccida was perforated immediately above the short process of the malleus. Necrosis of the malleus-head had occurred in all the cases. The course of after-treatment lasted for from one to two months. Two cases are noted as being merely benefited; the others were "cured."

H. Macnaughton Jones,[6, Aug. 3] in a long and valuable paper on *the etiology and treatment of suppurative disease of the middle ear*, refers to the anatomical structure of the ear and its surrounding parts, in which all the essentials for the reception and culture of micro-organisms are present. Reference is made to the works of the best-known investigators upon this subject, and a long list of the diseases depending upon microbic life is detailed. Stress is laid upon the dangers of infecting the ear by the use of uncleaned instruments and the application of microbe-breeding oils and solutions. Inflammation of the upper respiratory tract, arising simply as a result of parasitic diseases, must receive careful and early attention by antiseptic treatment of the nose and naso-pharynx. Adenoid growths are found to be a frequent source of irritation. The author gives a list of remedies in the order in which he has found them most useful: Corrosive sublimate, iodine, salicylic acid, carbolic acid, boracic acid, permanganate of potassium, chloroform, and alcohol. Some agents act especially upon spores, as iodine, bromine, and oil of mint. Some do not kill the spores, as sulphurous acid and alcohol; the former of these does not penetrate into the tissues, while the latter seems only to arrest the development of bacteria. For the removal of granulations the forceps or the crocodile lever-ring forceps shown herewith are recommended.



MACNAUGHTON JONES'S FORCEPS.
(*Lancet.*)



MACNAUGHTON JONES'S CROCODILE LEVER-RING FORCEPS.
(*Lancet.*)

After the use of either instrument, bleeding can be arrested by syringing with hot water and by pressure made with cotton on a holder. The author then applies chloro-acetic acid to the raw surface by means of cotton on a holder, or a solution of chromic acid, 1 drachm to 1 fluidounce (3.8 grammes to 30 cubic centimetres). The treatment detailed in the rest of the paper does not differ from the usual routine course. Patients are taught to use Politzer's bag for the inflation of their ears instead of employing Valsalva's method, the author believing, with others, that this procedure causes congestion of the tympanic and labyrinth vessels.

In perforations of Schrapnell's membrane and purulent discharge from the "attic," Politzer[136, Oct. 15] employs antiseptic washes of resorcin, 3-per-cent. solution, and of corrosive sublimate, 1 part to 2000. These are injected through Hartmann's cannula or elastic tube. Boracic acid, iodol ($\frac{1}{20}$), iodoform, drops of $\frac{1}{10}$ solution of silver nitrate are also employed. This list embraces the medicinal remedies used by Politzer. When necessary, adhesive bands should be cut with the stylet invented by the author. This will open the space to more thorough cleansing. Where the malleus is necrosed this ossicle should be removed. Carious bone should also be taken away, this operation being most thoroughly done by the use of sharp curettes, of which Politzer has devised many different forms. These same instruments can also be employed to remove polypi and cholesteatomatous masses.

The same authority[136, May 1] outlines his method of *treatment for granulations within the tympanum.* The well-known medicaments have not been very certain in their results. Politzer relies mainly upon: 1. Operative treatment, the removal of the larger granulations by the curettes already referred to. After the operation instillations of alcohol are employed for a varying length of time. 2. Cauterization with silver nitrate. Crystals are melted; the end of a fine probe dipped into this fluid, and then applied directly to the granulations. This causes severe pain, and the results are not always decided, owing to the film of silver albuminate which shields the deeper tissue of the growths from being acted upon. Politzer, therefore, recommends this agent only in cases where granulations are but slightly developed or where other remedies have failed. 3. Perchloride of iron. This can be used either in crystalline form or in saturated solution. In the latter case it is employed in the same way as described for silver-nitrate solution, or can be applied by cotton on a holder. Less pain follows the application than is caused by silver nitrate, and it penetrates deeper into the tissue. Crystals should be used when the growths are excessive and dense. These are applied by means of specially-made pincers, the crystal being held in place by a cotton tampon, which also serves to protect the external auditory canal. 4. Chromic acid. Either apply as done in the case of silver or perchloride solutions, or by fusing a crystal of the acid upon the end of a fine probe. The resulting action is effective, but the agent causes considerable pain. Politzer prefers ferric perchloride. 5. Electro-cautery. Having applied cocaine, a cautery point of the proper size is applied directly to the granulations. It should not be heated until in actual contact with the growths. Smoke must be blown from the canal before making a second application. The electro-cautery can be thus used three or four times during each *séance*. Politzer states that he has often known the granulations to disappear after two or three cauterizations, even over points which have not been directly touched by the cautery.

The use of electricity in otorrhœa is also the subject of an article by Eitelberg[650, No.3] reporting the method employed by Gomperz, an assistant of Gruber. This agent is employed for the removal of polypoid growths. A strong current is used and considerable pain is produced in spite of applications of strong cocaine solutions. It is resorted to in cases where the snare or curette cannot be easily used. Sometimes a single application will destroy a polyp of large size, after which the otorrhœa ceases. In other cases a long course of treatment will fail to stop the discharge, even after destruction of the growth. Two methods are employed. In one, an electrode (cathode) is placed against the mastoid process. The other pole, consisting of a platinum needle, is pushed as deeply as possible into the growth. This end must be so arranged as to be movable in any direction, and its point must be adjustable to any angle. By the other method, the two poles are fastened together and are both introduced into the growth. The *séance* cannot be endured for a longer time than two minutes. Ten cells of a Siemens-Holske battery are used. The necessary electrodes are made by H. Reiner.

Three cases are reported by Ralph W. Seiss,[112, July] in which *serious cerebral symptoms were occasioned by the pressure of large polypi*. In the first patient there was found an enormous, lobulated, aural polypus, projecting beyond the meatus and completely blocking the external auditory canal. It sprang from the lower portion of the tympanum. The patient suffered from epileptiform convulsions, unbearable headache, and elevation of temperature. The gait was unsteady. In the second case a polypus also filled the external auditory canal. There was complete paresis of all muscles supplied by the facial nerve and the patient could not close the left eye. There was marked vertigo, great weakness, and pallor. This growth was attached to the entire wall of the tympanic cavity. The third patient exhibited a mulberry-like polypus, which projected beyond the meatus. Weakness, nausea, and faintness were the subjective symptoms. Each of the cases had suffered for many years with purulent discharge from the affected ears. The growths were removed by means of Blake's snare, armed with fine saddlers' wire, the bases of the polypi being cauterized with fused crystals of chromic acid applied upon the end of a probe. The cases recovered rapidly and all cerebral symptoms disappeared.

Our corresponding editor, A. Gouguenheim, of Paris, states that two papers upon *loosening the stapes* were presented at the International Congress of Otologists and Laryngologists at Paris, the authors being Moure and Miot. Moure considers this procedure to be merely transitory in its effects, useless, and even dangerous in the condition known as dry catarrh, or plastic otitis, but recommends it in cases in which adhesions have formed as a result of suppuration. Miot has performed the operation in many cases, and claims to have effected an improvement in 74 patients. According to him, the indications are: Deafness following a purulent otitis, with perforation of the drum-head, without improvement in hearing, and in some cases where much tinnitus exists without perforation. Contra-indications: Long-existing perforation of the drum, with failure to perceive sounds by bone conduction, without subjective noise; labyrinth disease; cases of complete ankylosis of the stirrup. Operation: A flat knife is used, which is introduced at the incudo-stapedial articulation after having incised the membrane freely upon the side of the bony canal. Lateral pressure is applied until the patient complains of discomfort. Results: Benefit as to cranial perception, acuteness of hearing, and tinnitus. It is sometimes necessary to repeat the operation. Miot declares that the operation is without danger if careful antiseptic precautions are observed. The author refers to 1 favorable case where the satisfactory results lasted for sixteen months.

As to the *general therapeutics of otorrhœa*, the year does not seem to have added many new remedies for the treatment of this condition. *Creolin* has been extensively tried, but the reports vary as to its usefulness. Lichtwitz[14, No. 78, '88] finds it to be a powerful antiseptic, of easy application, and not poisonous. For otorrhœa it should be used in a solution, 1 to 1000. This is to be instilled into the affected ear, and the solution should be gradually increased in strength. Eitelberg[113, No. 18, '88] advises the use of creolin for syringing the ear in cases of otorrhœa. He employs a solution of 10 drops in about 1 pint (½ litre) of warm water. This solution is also to be instilled into the ear and allowed to remain there for about ten minutes. The drug's very unpleasant taste makes it objectionable for use by injection through the Eustachian catheter.

Bürkner,[328, Oct. 3] in his report for the year 1888–89 of the polyclinic for ear diseases at Göttingen, expresses doubt as to the antiseptic power of such weak solutions—6 to 10 drops in 1 pint of water. The opacity of this solution makes it difficult to discover substances which the fluid escaping from the ear during syringing may contain. Some cases, however, heal more readily under the use of creolin than by treatment with any other drug, in consequence of this agent's power to lessen secretion. In conclusion, he states his belief that the disadvantages of creolin are in excess of its good effects.

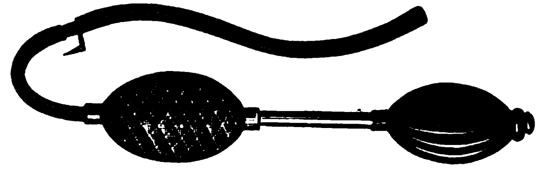
Robert L. Randolph[59, July 27] refers to the difficulty of applying antiseptic dressings to the ear, owing to its anatomical structure and its numerous means of communication with other cavities, as well as with the external air. The writer has obtained his most unsatisfactory results from the use of *carbolic acid*. The solution, which can be safely used, is of very weak antiseptic power and often causes irritation of the skin of the external auditory canal. *Iodoform* has served him well, but patients object to its odor. The question as to its antiseptic value is still a vexed point. *Boracic acid* has been efficient, but its reckless use has often caused retention of pus, mastoid disease, and cerebral abscess. Schwartze advises against its use when the secretion is thick and abundant. With such it forms a sticky mass, which will cause obstruction to the escape of pus. Its "cures" are often due to mere blocking of the perforation while pus accumulates behind it in the tympanum. The author's best results have come from the use of a solution of *mercuric bichloride*, 1 part to 3000, 1 to 8000, or 1 to 10,000. Following the advice of Laplace and Behring, this solution should be made slightly acid, thus preventing the coagulation of albumen, ordinarily caused when the sublimate solution comes in contact with pus:—

℞ Hydrarg. bichloridi, . . .		gr. ss	(0.032 gramme).
Acid. tartar., ...		gr. xx	(1.29 grammes).
Aquæ, ...	q.s.	f℥v	(147.8 grammes).

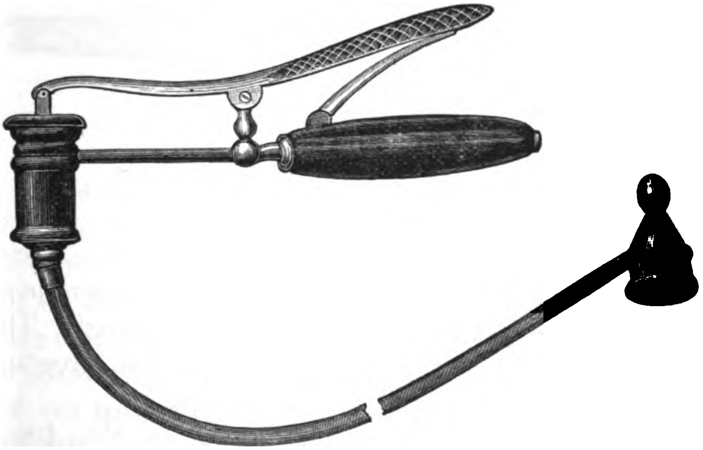
Having syringed the ear with warm water, the patient fills the external auditory canal with this solution. It is retained for from ten to fifteen minutes and is then allowed to escape. The meatus is then closed with a piece of cotton moistened in this same sublimate solution. This treatment is to be repeated two or three times daily. Almost immediately the discharge becomes less in quantity and fœtor soon disappears.

Reference is made by F. Kretschmann[828, Apr.] to a method of treatment which has yielded him good results in various forms of otitis. He had noticed that many patients suffering with affections of the middle ear, and made worse by diseased conditions of the naso-pharynx, also complained of cold and sweaty feet. This latter condition seemed to aggravate the nasal inflammation. Brandau[41, Nos. 68, 69, '86] had recommended the use of a fluid called *liquor antihidrorrhoicus*,—a substance belonging to the series of ethers. For one year and a half Kretschmann used it with favorable results in the class of cases referred to. A sufficient amount of the liquor is poured into a foot-tub (not metal) to submerge the soles of the feet. The patient having bathed his feet in warm water and dried them, places them in the fluid, where they should remain for from five to ten minutes. The liquor must not touch any abraded surface. Slight burning is caused. After removal from the foot-bath, the feet are again bathed in warm water and carefully dried lest any of the liquor should remain upon them. They must then be maintained in the horizontal position for from one-half to one hour. The treatment should be performed every three or four days, and later more infrequently. In eight to fourteen days the epidermis will begin to come off.

Non-purulent Disease of the Middle Ear.—According to

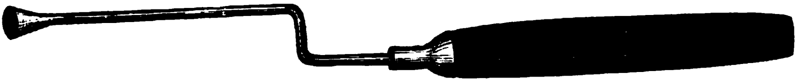


Lucae's Double Bag.
(*Provincial Medical Journal.*)



Delstanche's Air-Pump.
(*Provincial Medical Journal.*)

Adolf Bronner,$^{26}_{\text{June 1}}$ the treatment of abnormalities of the nose and naso-pharynx is of primary importance in the local treatment of non-suppurative diseases of the middle ear. Acute catarrh of the middle ear can be relieved by instillation of glycerin of carbolic acid (British Pharmacopœia). This procedure, devised by Hewson, will lessen pain and, it is claimed, prevent perforation of the drum-head. In addition, leeches can be used over the mastoid region and hot fomentations applied. Paracentesis must be performed when effusion occurs into tympanum. In chronic catarrh, when the Eustachian tubes are stenosed by thickened mucous membrane, it is advised to force vapor of menthol —from a 20-per-cent. solution—into these tubes. This solution is made by dissolving menthol in alcohol. Lucae's double bag is employed. Its disinfecting capsule—a small attachment above the second bag—is filled with cotton moistened in the menthol solution. Compression of the first (lower) bag forces the vapor into the Eustachian tubes. When stenosis results from more permanent thickening, it is recommended to pass celluloid bougies through the Eustachian catheter and to the isthmus of the tube. Immovable drum-heads can be loosened, adhesive fibrous bands being stretched, and the ankylosed joints of the ossicles massaged by means of Siegle's pneumatic speculum, to which the little air-pump of Delstanche is attached. By this instrument the air of the external canal is rarefied and condensed. Lucae's pressure-sound accomplishes a similar result, but requires more skill in handling. Its end being placed against the short process of the malleus, pressure is made at that point. Ward Cousin's modification of Politzer's bag also causes movements of the drum-head by acting upon the air-pressure within the tympanum. The end having been introduced into the nostrils, the bags are compressed and allowed to expand suddenly, thus alternately rarefying and condensing the air. In greatly-retracted drums a prominent posterior fold can be incised. If the drum-head is much thickened, Schwartze has advised and practiced its removal with the malleus. Nothing but what has already long been used is advised in sclerosis, or plastic catarrh. The author recommends the vapor of menthol and eucalyptus.



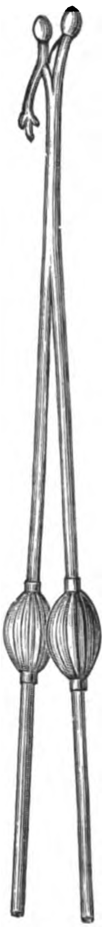
LUCAE'S PRESSURE-SOUND.
(*Provincial Medical Journal.*)

Perforation of the Round Window.—According to report of our corresponding editor, Trifiletti, of Naples, Cozzolino, in a case of sclerosis of the middle ear following purulent otitis, accidentally perforated the round window with the galvano-cautery point. As a consequence, the patient's condition was improved. The opening of the window relieved the intra-labyrinthine pressure which had caused the tinnitus, deafness, and vertigo.

Reduplications of Mucous Membrane in the Attic of the Tympanum.—Blake and Bryant[99, May, 30] made a careful study of these folds, which were never before so completely described. As a result of the examination, it was found that among the twenty-six temporal bones which were dissected 85 per cent. had the space above Schrapnell's membrane wholly inclosed by mucous folds and 77 per cent. had the upper part of the tympanum practically cut off from the lower by mucous folds which stretched at least half-way across the cavity.

INTERNAL EAR.

Inflammation of the Labyrinth following Scarlatina.—As a result of scarlatina, three different conditions of the aural mucous membrane are noted by L. Katz:[41, July, 8] 1. Great swelling, with serous infiltrations of the connective-tissue stroma. In such conditions the exudate is purulent, and tends to perforation of the drum-head. 2. Necrosis of swollen mucous membrane, so that, in many cases, the ossicles are denuded of periosteum. The exudate is usually offensive. 3. Acute carious process upon the wall of the labyrinth and the ossicles. This condition soon leads to inflammation of the membranous labyrinth, and is of the utmost importance. The usual means of entrance for micro-organisms into the labyrinth is through the Eustachian tube and tympanic cavity. One case is reported, in which, during an attack of scarlatina with diphtheritic membrane in the naso-pharynx, the patient died from meningitis. This resulted from otorrhœa of the right side, which had involved the right labyrinth. The left labyrinth was also inflamed to such an extent as to be necrotic, but the tympanic cavity of the same side was entirely normal. The author believes that the left labyrinth had become involved from the already-existing meningitis (neuritis descendens), which, in turn, had resulted from purulent otitis of the right side. These cases all show rapid and intense inflammation, with quick destruction of the parts involved. Treatment does not differ from that usually employed for simple inflammation of these parts. In chronic cases, pilocarpine is the only agent of any real value, and this is uncertain in results. Iodide of potassium can also be tried.



Cousin's Modification of Politzer's Bag. (*Provincial Medical Journal.*)

Total Loss of Hearing in Both Ears consequent upon Mumps.—Barr[218, June] reports 2 cases, both patients having been totally deaf since the onset of the attack. One patient had suffered from purulent otitis; the other case presented normal membranæ tympani. The author believes that in such cases the lesion is located within the labyrinth. Inflammation can extend from the parotid gland into the external auditory canal or middle ear by the way of the incisuræ Santorini (clefts in the cartilage). Roosa, of New York, says that it first involves the tympanum and then passes through the inner wall of this cavity into the labyrinth; others, that it follows the course of the facial nerve. The author believes that the involvement is metastatic, as in that of the testicles or mammæ; that the poison of mumps—shown by Ollivier to be in form of micro-organism—attacks, in certain cases, the circulation of the labyrinth, causing hæmorrhagic exudation or embolism of the internal auditory artery in its cochlear or vestibular branches. After absorption of this exudate there may remain atrophy of the nerve-structure. Since Buck, of New York, read a paper on this subject before the American Otological Society, 29 cases of this condition have been reported in America, France, Germany, and 1 in Great Britain. In 8 of these both ears were involved; in 22 only one ear was affected. In all the complication came on suddenly from the fourth to the eighth day after the onset of the mumps, was attended by total loss of hearing which proved permanent, and was looked upon as undoubtedly of labyrinthine character. In 11 cases tinnitus and vertigo were observed; in the others vertigo was not complained of, but may have existed, the notes of many cases being made a long time after the attack. Physicians should look for this complication during an attack of mumps. Beyond the interest of collecting notes of such cases is the fact that much might be done to hasten the absorption of the exudate in the labyrinth, pilocarpine being the agent which is suggested.

Electrolysis of the Acoustic Nerve.—Gradenigo[37 Mar.] states that, from a therapeutic stand-point, the results obtained are not considerable or lasting; still, in some cases of disease, especially those of an inflammatory nature, the use of the constant current to the ear has, for a short time after the *séance*, given decided relief, not only to symptoms resulting from conditions within the ear itself, but also to concomitant cerebral symptoms. The constant galvanic current is recommended in cases of middle-ear sclerosis. Some temporary improvement will often be noted during its use in this condition, and results, on the whole, are better than are obtained by any other therapeutic agent. The galvanic current is of great importance for exact diagnosis and prognosis. As a result of his experiments, the author concludes: 1. That the electrical reaction of the acoustic nerve should be attributed to the trunk of the nerve itself, and not to the labyrinth. 2. That the electrical test of the acoustic nerve is more delicate and perfect than the functional test. 3. As a test of the condition of the peripheral extremities of the acoustic nerve, we possess in the galvanic current a method which ought to be compared, in importance, with that of the ophthalmoscope in examinations of the peripheral ends of the optic nerve. By means of the electric examination we can judge as to the integrity of the auditory nerve or the degree in which it participates in the different pathological conditions of the ear; its practical value is in the diagnosis of intra-cranial affections.

MASTOID PROCESS.

Mastoiditis.—Holger Mygind, of Copenhagen, corresponding editor, sends a monograph[371] by Schmiegelow. The following extract has been made from this paper:—

Thirty Cases of Resection of the Mastoid Process.

The ages of the patients were as follow:—

Under 1 year,	3 cases.
1 to 10 years,	5 "
11 to 20 "	6 "
21 to 30 "	12 "
31 to 40 "	3 "
41 to 50 "	..
Above 50 "	1 case.
Total,	30 cases.

Duration of Suppurative Otitis.	Number of Cases Observed.	After Operation.	
		Suppuration Ceases and Membrana Tympani Heals.	Suppuration Continues.
Under 1 month	7	7	..
From 1 to 2 months	5	5	..
" 2 to 6 "	2	1	1
" 2 years	1	1	..
" 4 "	1	..	1
" 10 "	1	1	..
Many years	10	..	10
Total	27	15 (56 per cent.).	12 (44 per cent.).

During the operation, in 6 cases the dura mater was more or less visible at the bottom of the wound. In 2 cases there was much hæmorrhage as a consequence of injury to the lateral sinus. One of these patients died suddenly on the seventh day after operation during favorable convalescence. In the remaining 6 recovery was complete. In 1 case a large abscesss (epidural) was successfully opened. In only 7 cases a communication existed, shown by irrigation, between the wound and the tympanic cavity. Among the first 7 cases, 1 ended fatally; among the others, 3 were cured, while suppuration from the tympanic cavity continued in 3 cases. Among the 20 cases where there was no communication, 11 were cured; that is to say, the suppuration was stopped, while it continued in the other (9) cases. After operation the treatment consisted of irrigation with sublimate solution, after which the wound was packed with iodoform gauze; in addition, a large layer of sublimated cotton was applied. As a rule, this dressing was not changed for six or eight hours. In 2 cases erysipelas developed. The only fatal case died suddenly upon the seventh day after operation, death being undoubtedly caused by an embolus in the pulmonary artery, the origin of which could not be attributed to the operation itself.

Finlayson and Barr[213 May] described, before the Glasgow Pathological and Clinical Society, a case which is of especial importance as illustrating the *results of neglecting proper measures for the treatment of otorrhœa*, and also the extent to which cerebral lesions can advance without interference with function. The patient, a man aged 22 years, had suffered from fetid otorrhœa since his fourth year. As a result of injury to the external auditory canal, his chronic ear disease assumed acute conditions, and the man soon showed many symptoms of cerebro-spinal meningitis. There were a few polypoid growths in the meatus of the affected ear (right). There was no local evidence of mastoid disease. There had been slight paralysis of the right facial nerve since the onset of these symptoms. The symptoms seem to have been singularly out of proportion to the lesions found at the post-mortem examination. The patient died in a comatose condition. At the autopsy there was found thrombosis of the right longitudinal sinus, purulent exudation at edge of longitudinal fissure at upper part of frontal convolution; also, on left side, at posterior part of frontal convolution. Much fluid was found at the base of the brain, which was purulent near the medulla. Adherence of the membranes to the bone existed at the right internal auditory meatus; here, also, was a spot of necrosed tissue which involved the anterior extremity of the right lobe of the cerebellum and the side of the pons (slightly) at its posterior part. The base of the brain showed extensive purulent inflammation, this process seeming to extend from the necrosed point above indicated. In short, the entire surface of the brain presented this condition, in localized spots, as the result of this process. Fetid pus oozed from the internal auditory meatus. The membrana tympani was almost completely destroyed and the tympanum filled with a mass of granulations, in which the ossicles, displaced from normal position, were buried, the incus having disappeared. The facial nerve of right side was denuded of its bony casing. The mastoid cells were converted into hard, dense bone, but the antrum, larger than normal, was filled with thickened mucous membrane, granulations, and decomposing caseous pus. The labyrinth wall of tympanum had been perforated by carious openings communicating with the external semicircular canal, vestibule, and cochlea. The fenestra ovalis was enlarged by carious erosion and the stapes foot-plate entirely separated from it. The fenestra rotunda was closed by hyperostosis. The inner vestibular wall was eroded and the scala vestibuli and the two mouths of the semicircular canals exposed. Within the internal auditory canal the facial and auditory nerves were inseparably united, the pus having evidently passed through this canal to reach the brain.

Richard Williams[187 Jan.] quotes the assertion of Damer Harrisson that 50 per cent. of all cases of *cerebral abscess are due to suppurative otitis.* The 3 patients reported by Williams all presented grave cerebral symptoms. One died, and the autopsy revealed most extensive destruction of tissue, and an abscess the size of a hen's egg was found in the temporo-sphenoidal lobe. Before death an operation had been performed upon the mastoid, but its cells were entirely closed and no pus was found. The patient's age was 23 years. The third case noted was a man of 24 years. His mastoid cells were also sclerosed and no pus was discovered. The first patient was a boy of 10 years. His mastoid antrum was full of caseous pus, and drainage was established between this and the tympanum. In reference to such conditions the author observes that a few years ago such cases would have been considered hopeless, even the great master—Politzer—having thus once declared them. Fairly good results are now obtained by surgeons, but it must be carefully decided whether a case is one of merely tympanic inflammation or if deeper structures are involved, while the symptoms do not reveal such involvement. The author believes that, where mastoid disease is indicated with reasonable certainty, the operation of opening the cells should not be delayed until cerebral symptoms manifest themselves. In the discussions of this paper the general opinion favored operative interference before the condition had produced septicæmia, which would possibly kill the patient, even after the pus-cavities had been opened. Harrisson, agreeing with this principle, thus stated the difficulties of diagnosis in cases of cerebral abscess: 1. The destruction of cerebral centres is not always followed by loss of function associated with them. 2. A lesion may cause functional disturbance in distant portions of the brain. 3. Symptoms of motor disturbance may be present without the existence of any pathological lesion to account for them. He looked upon the operation of opening the mastoid cells as being one of minor surgery, and that no surgeon should hesitate to perform it for exploratory purposes, considering the fatal nature of cerebral lesions.

Four months after recovery from purulent otitis, a patient, whose case is reported by Oren D. Pomeroy,[188, Jan. 15] began to experience severe pains in the neck, extending to the shoulders; six days later deep-seated pain was felt in the right eye, with impairment of vision and some redness of the globe. Soon after this the symptoms of suppurative irido-choroiditis were all present. The right ear began now to discharge, pus coming through a perforation of the drum-head. As disease progressed it became necessary to enucleate the affected eyeball. This was collapsed and full of pus. For two weeks the patient's condition improved, the pains about back and neck continuing. A painful swelling appeared beneath the trapezius muscle, its long diameter being in a vertical direction, extending from near the shoulder to within 2 inches (5 centimetres) of the ear (right) and anterior to the mastoid process. Upon opening this swelling, 2 ounces (60 cubic centimetres) of pus escaped. The meatus of the affected ear was full of pus, and rough, denuded bone could be felt at the inferior wall of the osseous meatus. The patient eventually recovered, the ear healing, and his hearing increasing "several inches for the watch and being good for the voice." Few such cases have been reported. Pus from a suppurating ear might reach the eye either through the circulation or by accompanying meningitis, which involved the sheath of the optic nerve. In the case reported the author believes that the inflammation extended directly from the ear to the meninges.

Two cases of *mastoiditis* were *treated with the electro-cautery*, by Lacoarret.[780 Jan.] The first case was one of mere periostitis; in the second the cells themselves were involved. In both cases deep incisions were made with an electro-cautery point over the mastoid region. The patients recovered in the course of a few weeks. Antiseptic applications were constantly made through the external auditory canal, thus preventing accumulation of pus in the middle ear.

Ménière,[100 Feb.28] in an article on the use of *Paquelin's thermo-cautery in periostitis of the mastoid process*, describes the employment of this agent, which acts much as would the electro-cautery. An incision is burned into the periosteum, varying the length according to the requirements of the case. The advantages offered by this procedure over the incision of Wilde are: 1. The small degree of pain. 2. Avoidance of hæmorrhage. 3. Simple dressings for the after-treatment. 4. Less danger of septic infection. The results are as satisfactory as those effected by Wilde's incision, while cure is more rapid and complete. Should it become necessary afterward to open the mastoid cells the cautery wound can be enlarged and the operation conducted in the usual method.

A. Ricard[100 Feb.28] is in favor of using hammer and chisel for opening the mastoid process in preference to sawing instruments. He advises opening the process in its posterior part.

In an article on the aural clinic of Hermann Schwartze, at Halle, Charles H. May[1 May 26] outlines the method employed for catarrhal cases. Much stress is placed upon thorough antisepsis and free drainage. For syringing, Meyer's douche (Fig. 1) is employed. It is especially useful in large aural dispensaries. The naso-pharynx is to be treated in all cases of otitis attended by nasal and throat abnormalities. Hypertrophied tonsils must be removed and adenoid vegetations destroyed. This latter process is best accomplished by using Meyer's ring-knife (Fig. 3) or Trautman's sharp spoons (Fig. 2). The ring-knife is introduced through the nares, a finger being placed in the naso-pharynx to act as a guide. Trautman's spoons are introduced through the mouth, and thus to the pharyngeal vault. Fig. 4 is Meyer's mouth-gag and Fig. 5 the finger-protector used in digital exploration and operation in the vault. For opening the mastoid cells, the indications are: "1. Acute inflammation of the cells with retention of pus, if, after the application of cold by ice-bags or coil, and after Wilde's incision, this treatment not continued longer than a week, the œdematous swelling, pain, and elevation of temperature do not disappear. 2. In chronic inflammation of the mastoid, where repeated attacks of swelling with consequent improvement have taken place, or where there has been the formation of abscess and fistulæ, pointing or opening at or through the skin of the mastoid region, the neck, auditory canal, or pharynx. 3. In cases in which, although the mastoid appears healthy, externally, there is retained pus or cholesteatoma of the middle ear, which cannot be evacuated by the natural channels, as soon as symptoms ap-

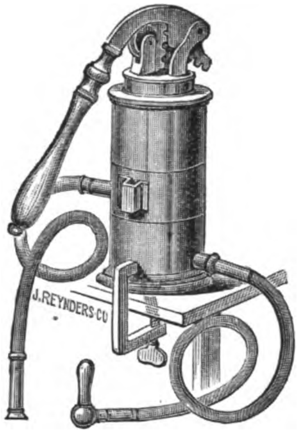


FIG. 1.
(*New York Medical Journal.*)

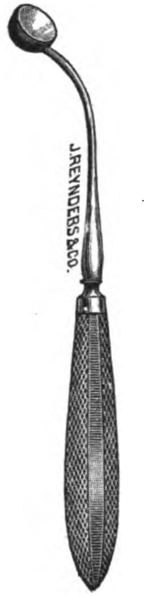

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FIG. 2.
(*New York Medical Journal.*)

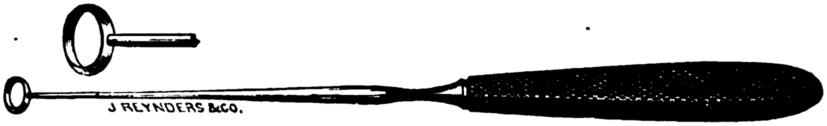
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FIG. 3.
(*New York Medical Journal.*)

pear which indicate that complications dangerous to life are imminent. 4. In cases of long-continued pain in the mastoid region, although the bone is apparently healthy, when the pain is not controlled by other remedies. 5. As a prophylactic measure against the fatal consequences which might ensue as a result of incurable purulent inflammation of the middle ear, with fetid discharge, in cases in which there are no other symptoms of retention of pus in the middle ear except an obstinate, penetrating fœtor of the pus, despite careful cleansing and disinfection through the auditory canal and Eustachian tube. In these cases the antrum is opened and kept open for a time, in order to permit of the washing out of the middle ear from behind."

The paper gives the exact lines by which the area of operation is mapped out. The spot is about at the level of the superior wall of the external meatus and 1 inch behind it. A round or oval piece of bone is chiseled off in successive layers, a cone-shaped tract being removed which points downward, inward, and forward. The antrum is reached and free passage made into the tympanic cavity. Through this passage, in addition to antiseptic dressings, in which iodoform plays an important part, systematic syringing is continued for some time, the solution used being one of corrosive sublimate or carbolic acid. When the discharge indicates a healthy condition of the parts the wound is allowed to close, it having been kept open by the insertion of a lead nail, which is gradually shortened as the granulations increase from the bottom of the wound. Treatment for acute cases usually requires from one to three months; chronic cases, nine to ten months. Cholesteatomatous masses must be removed, and this sometimes requires a permanent opening in the mastoid. Schwartze's mortality in 214 cases was only 6 per cent.

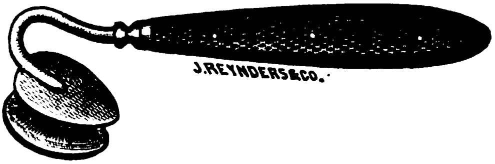


FIG. 4.
(*New York Medical Journal.*)

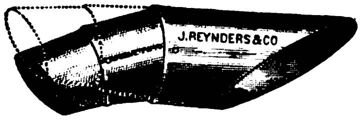


FIG. 5.
(*New York Medical Journal.*)

Sonnenburg$^{4}_{\text{Apr.18}}$ reports a case of *chronic emphysema of the skull.* There was, undoubtedly, a communication between the pharynx, middle-ear cavity, and mastoid cells. The outer walls of the latter having become perforated, air had found access into the tissues above this part. In the discussion of his case, Virchow referred to the possibility of an incomplete union, resulting in a fissure between the mastoid process and the adjacent parts of the temporal bone, or from traumatism, which had produced a separation of these parts.

A. D. Williams, of St. Louis,[109 Mar.] gives notes of a case of *connective-tissue abscess over the mastoid process*, occurring in a child, aged 14 years, of strumous diathesis. There was no connection with the bone, nor had the child ever suffered from otorrhœa. The symptoms, however, all resembled those of mastoiditis.

Cozzolino[87 Jan.] arrives at these conclusions: 1. That mastoiditis is usually the result of chronic purulent otitis, rarely of acute purulent otitis, and, more rarely still, of lesions in the external auditory canal. 2. In all cases of this disease, granulations or polypi exist in the auditory cavities, the escape of pus being thus prevented from the tympanum into the external canal. There may be tumors in the latter or stenosis may exist, as found sometimes in mastoid inflammation, which is secondary to acute purulent otitis. The pus, being unable to escape, becomes a focus of infection or undergoes chemical changes which produce acids capable of eroding the bony structure. Hence, the need of thorough antiseptic treatment. 3. It is possible, by such treatment, to cure mastoiditis without having recourse to operative measures. 4. Politzerization cannot possibly cause mastoid inflammation, as has been maintained by Michael. 5. Opening of the cells is absolutely necessary where neoplasms exist within the mastoid process, or other osseous lesions, such as sequestræ. Operation, however, is not always required when there is simply a carious process, as both endo- and peri-mastoiditis accompanied by caries can be cured by antiseptic treatment of the aural cavities. This should first be thoroughly attempted before resorting to operation, unless symptoms of cerebral complication are indicated. 6. For the diagnosis of such complications especial importance should be given to ophthalmoscopic examination, especially when the patient suffers from otorrhœa, with persistent headache, nausea, and vomiting.

Henry T. Morse[99 Dec.20,'88] believes that many patients suffering from *mastoiditis can be cured by the general practitioner without* *recourse to an aurist*, if the usual methods for preventing this condition are used in time. He mentions such in detail: Paracentesis of the tympanum; thorough inflation through the Eustachian tubes; hot or cold applications over the mastoid region; leeches applied to the same part, and, where swelling and fluctuations exist, the incisions recommended by Wilde. Polypi in the canal or tympanum must be removed and caseous masses washed away by careful syringing. He recommends cleansing the tympanic cavity when a perforation through the drum-head exists, with otorrhœa, by syringing a weak solution of soda bicarbonate through the Eustachian tube by means of the Eustachian catheter. When inflammation, with purulent discharge, causes a bulging of the posterior wall of the external canal, and thus narrows its lumen, frequent and prolonged douching with warm water should be resorted to and the swollen tissues freely incised.

In regard to the *good effects of cleansing the tympanic cavity in otorrhœa by injections through the Eustachian tubes*, E. Van Millingen, of Constantinople, Turkey, collaborator, writes us that during twenty years of continual otological practice he has had recourse to trephining or chiseling of the mastoid cells only in 10 cases. This operation has been avoided in a large number of cases by the timely use of injections through the Eustachian tube, as recommended by him after successful trials of the method in 1869.

Mitzkuner,[8 Jan. 17] recommends that the *point at which trephining or chiseling the mastoid process should be commenced* can be safely determined thus: By drawing the ear forward a fold is formed immediately behind the auricle. Beneath this fold there is a flat, bony prominence. A depression will be found between this prominence and the base of the mastoid process. This area should be chosen for operation because: 1. A chisel can descend safely from ¼ to ⅓ inch (6 to 8 centimetres). 2. The transverse sinus, which varies its course in different individuals, never touches this point. 3. The only objection to the selection of this area is the possibility of puncturing the external auditory canal,—a danger which is nothing in comparison to that of injuring the transverse sinus.

A. Gouguenheim, of Paris, corresponding editor, states that Levi, at the International Congress of Otologists and Laryngologists, at Paris, described *a case of primary periostitis of the mastoid process.* The condition is usually bilateral. The aural apparatus is intact in these cases. Wilde's incision is the means of effecting a cure.

Küster,[328 Oct. 3] in an article *upon the principles of treatment of purulent discharge in cavities with dense walls*, refers to purulent otitis and mastoid inflammation. Treatment should be modified in accordance with the origin of the mastoiditis, whether it has resulted from retained pus within the tympanum or whether the mastoid inflammation is really a primary condition. For the latter condition, the opening of the cells and antiseptic cleansing of the same will be sufficient. He prefers the use of chisels, cutting away the bone in layers by a lever-like movement. If the diseases has originated in the tympanic cavity, granulations within this space must be removed, together with as much diseased tissue as can be reached. The posterior wall of the canal, close to the drum-head, is then perforated, and the opening connected with a channel chiseled from the mastoid process. This tract is to be thoroughly syringed, and a drainage-tube is passed through on packing of antiseptic gauze or lint. This operation is similar to one devised by C. Wolf, to which Schwartze objected on the grounds that it did not drain the tract, in which pus is apt to accumulate and undergo caseation, and that it endangered the sound-conducting apparatus of the ear to such an extent as to cause great deafness. Küster advocates early operation as soon as symptoms indicate septic poisoning or cerebral involvement, especially if these have not yielded to the usual simple methods of treatment. The causes of primary mastoiditis may be: 1. Tubercular ostitis of the mastoid process. It is analogous to the joint affections which occur in tuberculosis, and does not result from tubercular inflammation of the tympanic cavity. 2. Acute infectious osteo-myelitis of the mastoid process. 3. As a result of cholesteatoma: (*a*) formed by thickening and proliferation of the epithelium; (*b*) by congenital dermoid cysts of the inner ear and its vicinity; (*c*) by true pearly swellings. These are primary congenital swellings within the tympanic cavity. They possess, as a rule, a thin-walled sac containing fluid and a pulpy mass of epithelium, cholesterin, and fatty detritus. They are produced by the cutting off of a piece of the endoderm during fœtal life. As a rule, they cause no trouble until, by increase of size, their envelope is broken. This results in a purulent discharge from the ear in which the mass is carried away. In discussing this paper, Virchow agreed with Küster as to the possibility of pearly bodies in the middle ear being a result of abnormal development of the endoderm. He had frequently observed such growths in the vicinity of the middle ear. The seat of a similar formation was the cerebellar pia mater, especially that part lying near the temporal bone and directly connected with it by the acoustic nerve, viz., the region of the medulla oblongata and the pons. He stated that the seat of pearly swellings was within the bone, not in the auditory canal. The pearly swellings were found in the upper and outer corners of the tympanum in the region near the mastoid cells. This region is one of the latest—usually about the thirtieth year of life—to gradually change its compact structure, and, instead of its ivory-like formation, to develop air-containing spaces in connection with the tympanic cavity. In these spaces a species of mucous membrane at last develops. It is possible that the development of epithelial masses had a certain relation to these processes. There was a small probability that in the late union of the annulus tympanicus there might be an opportunity for the development of such bodies. In closing, Virchow made reference to the great practical importance of pearly bodies, which, according to his experience, were the cause of death in one-third of the fatal cases of purulent otitis. They should be removed completely as early as possible.

ACOUSTICS.

Injurious Effects of the Telephone upon Hearing.—According to Gellé,[87, July] these effects are caused by the quality of the sound, its closeness to the ear, and the exhaustion resulting from nervous irritation. Very often, in these cases, there has been a pathological condition in the ear, or abnormal nervous conditions which are made worse by the sounds of the telephone. In some cases a state of great nervous excitability is produced, with tinnitus, deafness, and pain in the ear to which the telephone is usually applied. Sudden loud noises are especially liable to produce this condition. It is advised that individuals suffering from ear disease should avoid any constant use of the telephone.

Hereditary Deafness.—Boucheron[14, Dec. 5,'88] states that sclerotic changes in the middle ear and degeneration of the auditory nerve manifest themselves at an earlier age in each generation of a family subject to this hereditary tendency. There appears to be a predisposition among such individuals to catarrhal conditions of the Eustachian tubes and tympanic cavities. Not only hereditary diseases—gout, rheumatism, syphilis, etc.—cause these changes, but such individuals are peculiarly susceptible to aural complications during the course of the exanthemata, typhoid fever, diphtheria, tuberculosis, and malaria. Treatment should consist of careful prophylactic measures. The children of such families should be cared for in regard to diet, exercise, and hygiene. These must sometimes be supplemented by antiarthritic or antisyphilitic treatment. All adenoid growths in the naso-pharynx must be removed and also enlarged tonsils, their crypts being seats for the growth of pathogenic microbes. During the course of the diseases already mentioned great care must be observed that patients of this class are treated for throat and naso-pharyngeal complications. When inflammation has appeared in the tympano-Eustachian tract, its reduction must be quickly effected and inflation of the tympanic cavity systematically practiced for some time in order to prevent ankylosis or the organization of fibrous bands. It may be necessary, when such adhesions have formed, to resort to surgical means for their destruction. This operation has been performed in 70 cases.

Relation between Disease of the Teeth and Ears.—Robert Barclay[59, Aug. 3] reports 20 cases of various aural derangements, all of which were accompanied by dental caries, eruption of teeth, crowding or malposition of teeth, and the aural conditions were not benefited until thorough dental treatment had been instituted. Sexton,[5, Jan.,'90] on reviewing the records of some 1500 cases (aural), finds that the teeth are more frequently the seat of disease than was at first suspected, for of these 1500 aural cases perhaps one-third owe their origin or continuance, in a greater or less degree, to disease of the teeth. And, again, that all the morbid conditions of the mouth described by him may exist without serious or recognizable aural affections being developed, cannot be denied; but progressive disease of the ear, often without the occurrence of pain, is more common when these aural affections are present.

Barclay[59, Aug. 3] concludes that oral irritation reflected to the ear produces, first, a change in the calibre of the blood-vessels through vasomotor influence; this induces hyperæmia, pruritus, abnormal glandular activity, and congestion of the integument of the canal and also of the mucous membrane of the tympanum. Organic changes result, and there is established a predisposition to exacerbations of the chronic process, and acute otitis may supervene.

An article upon this same subject is published by Goodwillie.[1 Aug. 24] The close anatomical relation between the nasal, oral, and ear cavities is described with great exactness, and the nervous connection is given in careful detail. The entire tract is "in touch," each part with the others, so that irritation, at any point, may be reflected and express itself by local congestion at another. For the successful treatment of middle-ear affections, all nasal and naso-pharyngeal disease must be removed.

Our corresponding editor, A. Gouguenheim, writes that Maneuvrier read a paper, before the Society of Anthropology of Paris, *upon the localization of auditory sensations.* The author's researches were conducted upon the brains of criminals. He has proved that alterations occur in the appearance of the first temporal convolution, which may be characterized as diminution in the folds, atrophy, and disappearance, these conditions being found among individuals who were deaf and whose middle ears were the seat of old lesions. At the same time, it is proved that in such individuals a considerable development of the visual centres of the opposite side has occurred as a compensation for loss of audition. The motor centres for muscles of the limbs of the opposite side were also more marked than is usually the case.

"*L'Audition Colorée.*"—Raymond,[100 July 2] has published the results of his studies upon this strange phenomenon. He believes that the condition cannot always be due to a communication of the auditory fibres with the optic centres, but that some mental cause must also be the origin.

Hypnotism.—A case of deafness (hysterical?) in both ears, lasting for six days, cured in one *séance* by suggestion, is reported by J. Burot,[241 Feb. 1] of Rochefort. A chlorotic girl, aged 19 years, was suddenly thrown into an unconscious state on account of grief at separation from a relative for whom she had much affection. During the swoon there was a slight tremor in the limbs. She remained in this state for one hour. Upon recovering consciousness she was almost completely deaf, not being able to hear any one who addressed her and hearing a watch only with great difficulty. For several nights following she was delirious and was distressed with the idea that she had lost the power of hearing. Her physician expressed an unfavorable prognosis, believing that the condition resulted from cerebral congestion. Six days after the primary attack the patient was hypnotized by Burot. In about ten minutes a slight tremor of the limbs occurred, and Burot said, "On awaking, mademoiselle, you will hear the name Elise when it is pronounced." About five minutes later she was awakened, and said, "I hear!" She not only heard the name Elise, but all that was said to her. It had been intended to fix suggestion upon one word only, as advised by Bernheim and Bérillon. The patient stated that the first word which she heard had been "Elise," but probably, without noting the fact, she had completed the suggestion by saying to herself, "Since I hear the name 'Elise,' I should be able to hear all words." The patient was completely cured.

Report of the Royal Commission on the Deaf, Dumb, and Blind. $\frac{2}{\text{Sept.28}}$—A slight decrease is noted in the number of deaf-mutes in the general population, while there has been a great increase in the attendance at school. Consanguinity in the parents is recognized as a most potent cause of congenital deaf-mutism. The causes of non-congenital deafness are chiefly scarlatina and other fevers in early childhood when prompt and efficient treatment has not been instituted. Twelve to 25 per cent. of the deaf possess some hearing-power. The existence of any degree of hearing should encourage attempts at increasing the power, especially among young children who have already learned to speak before becoming deaf. A day-school for the deaf is advocated, so that parents themselves can continue the child's training during the hours at home. When this cannot be done a "residental institution" becomes necessary. Compulsory education is insisted upon. The course of instruction should extend over eight years, beginning at 8 years of age. The pure oral system, as taught in the schools of Frankfürt, Vienna, and Milan, is recommended as in every way superior to the old "sign" system or the "combined systems," which consist of partly "oral" and partly "sign" instruction. The oral system is to be preferred, especially on account of the good effect which the use of the voice has upon the condition of the respiratory organs, and thus upon the general health of the deaf-mutes.

DISEASES OF THE NOSE AND ACCESSORY CAVITIES.

BY CHARLES E. SAJOUS, M.D.,
PHILADELPHIA.

ANATOMY AND PHYSIOLOGY.

Erectile Tissue.—J. Herzfeld, of Berlin,[29] published an exceedingly important article concerning the anatomy of the erectile tissue of the nasal mucous membrane. It will be remembered that Kölliker[1201] affirmed that the Schneiderian membrane was rich in muscular fibres; these, in connection with the venous plexus, glands, etc., adding considerably to its thickness. Although Zuckerkandl[1202] followed him with a more extended study of the subject, in which, besides the already-described muscular fibres, he called attention to the presence of a special muscle of great importance in the expansion and contraction of the erectile tissue, Voltolini,[1203] in his recently-published text-book, declares that he has been unable to discover either elastic fibres or organic muscular fibres in the nasal mucous membrane. The object of Herzfeld's article is to verify the observations of Zuckerkandl, and the results obtained are well shown in the annexed colored plate.

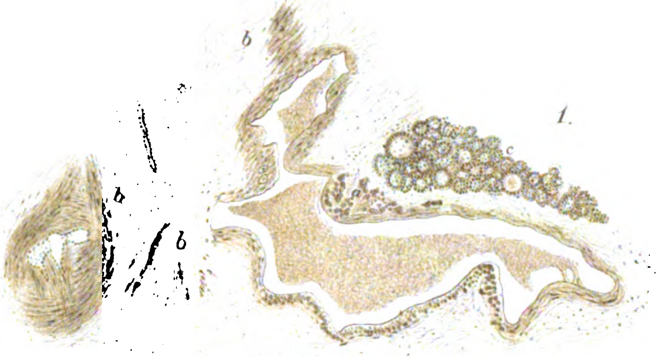
Fig. 1 represents a section of the mucous membrane of the inferior turbinated bone, greatly magnified, in which the muscular fibres may be observed lying transversely in the periphery of a large sinus. The latter appears partly filled with blood. At *a* a few individual remnants of muscular tissue are clearly shown, while at *b* numerous muscular fibres, generally met with in the connective tissue and in longitudinal sections, may be observed. Fig. 2 shows isolated muscular fibres, colored by means of eosin and hæmatoxylin to bring out the nuclei. At *a* only remnants remain, the nuclei being no longer visible.

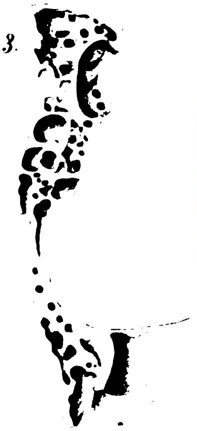
Concerning the presence of elastic fibres in the erectile tissue, Herzfeld found them very abundant, and considers them amply sufficient to account for the erection and contraction of the erectile tissue, the nervous supply emanating from the spheno-palatine ganglion, as shown by Zuckerkandl and further demonstrated by Aschenbrandt.

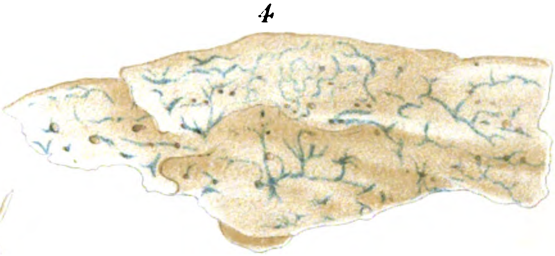
Herzfeld, following Zuckerkandl, disagrees with Voltolini as to the vascular supply of the membrane, and considers the numerous openings that may be seen with the naked eye upon the surface of the turbinated bones as the orifices of canals which, taking a course parallel with the length of the bone, finally terminate with intercommunicating spaces of irregular form in the bone proper. These spaces were found to contain fat, cellular tissue, and blood-vessels, the efferent veins penetrating the erectile tissue. That the veins have nothing to do with the erection of this tissue, and that they form in reality but a part of the *vasa propria* of the bone itself, Herzfeld tries to prove by the fact that the mucous membrane can be detached without the least hindrance from the bone, which would not be the case were there a close connection between the two, by membranous processes, vessels of large size, etc. Fig. 3 shows a section through the thickest portion of the inferior turbinated bone, in which the cavities can be distinctly seen. Fig. 4 represents the veins of the mucous membrane of the turbinated bones, and Fig. 5 the "marrow vessels" of the so-called and occasional "marrow cavities." Fig. 6 shows a section of a frozen turbinated body. At *a* are represented arterial sections with coverings; at *b*, veins arising in the bones; at *c*, the sinuses of the erectile tissue, filled with injecting fluid.

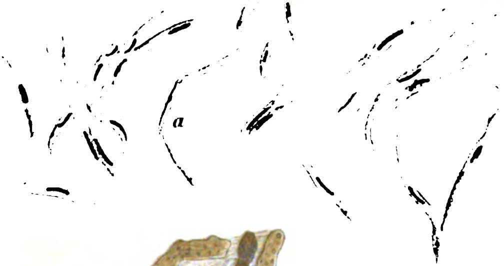
As to the manner in which the erection of the turbinated bodies is brought about, Herzfeld, considering that the openings in the bones are intended for the *vasa propria ossis*, accepts Zuckerkandl's conclusions: that the arterial supply corresponds exactly with that of the penis, the blood reaching the erectile tissue after having passed through the capillary net-work. The muscular contraction of the erectile tissue then forces the blood into five groups of veins, the external nasal plexus, the two venæ ethmoidales, the palatal and tonsillar.

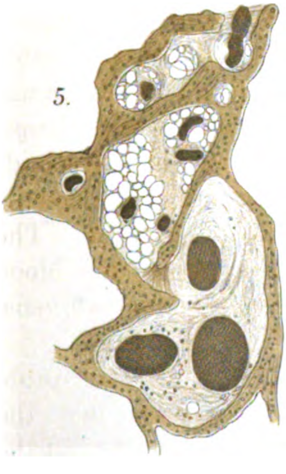
Olfactory Nerve.—C. L. Dana,$\frac{1}{\text{Sept. 7}}$ appreciating that the problem of olfaction is not satisfactorily settled, suggests that the olfactory tract, hippocampus, and uncus are not really parts of the temporal lobe, but atrophied remnants of a special lobe, the lobus limbicus, which at one time held a functional prominence equal to that of other lobes. As the importance of the olfactory nerve

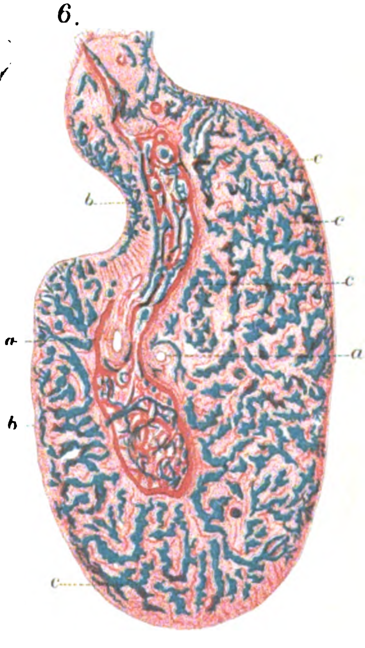








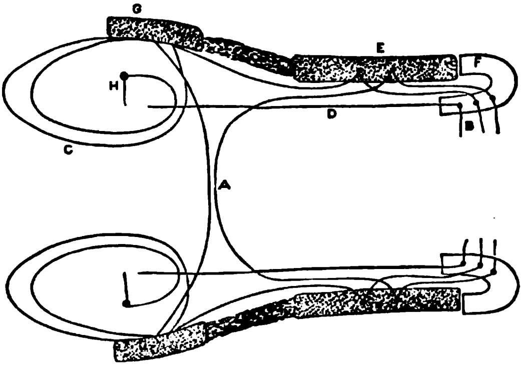




Anatomy of the Nasal Mucous Membrane. (Herzfeld)
Archiv für Mikroskop Anatomie.

Burk & McFetridge, Lith. Phila

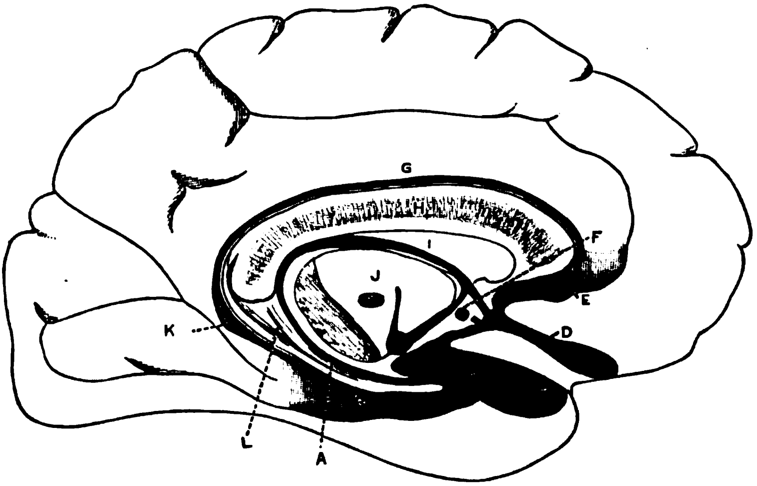
decreased, the lobe gradually became rudimentary. Like all other senses, the olfactory is believed to possess a representation in the optic thalamus, the fornix being the main carrier of impulses.



A. anterior commisure; B. olfactory nerves; C, exterior and interior loops; D. direct communication with basal ganglia; E, olfactory tract; F, olfactory bulb.

(*New York Medical Journal.*)

From the thalamus the fibres are supposed to pass to the cortex in the radiations from that ganglion. Following the opinion of Haycraft$^{47}_{\text{July,'88}}$ that the sense of smell as well as that of taste must



D. olfactory lobe; B. C. K, L, E, gyri callosi, dentatus, hippocampus, uncinatus, and fornicatus; I, fornix; J, optic thalamus; H, corpus callosum; G, striæ lancisi.

(*New York Medical Journal.*)

probably depend upon the rate of vibration of gaseous particles, just as the variations in sound depend upon the number of its vibrations, Dana had constructed a qualitative olfactometer by which the *quality* of the sense of smell can be tested, just as the hearing can be tested for musical pitch. Scientific harmonies and discords of smell are thus rendered possible, and he quaintly suggests that these may be utilized for the production of "actual symphonies in odor which shall awaken as deep emotion as the music of Beethoven." The instrument consists simply of two sets of phials, the one set containing monatomic alcohols of gradually-increasing molecular weight and graded flavoring; the other, fatty acids, also presenting suitable differentiating characters. A person with a normal sense of smell should be able to distinguish these substances and to establish their relations, just as a person with normal vision should not only see forms but distinguish colors. It is probable that by means of this instrument it will be shown that there are persons whose sense of smell is keen, but who are in reality odor-blind, just as there are persons with keen vision who are color-blind. That this qualitative odor-sense is developing in man there is no doubt, this quasi-clinical development showing very evidently that the first cranial nerve is not in its senility.

Anomaly of Turbinated Bone.—Massei, corresponding editor in Naples, reports an interesting malformation of the left inferior turbinated bone, observed by Trifiletti.[461 July] The patient, a man 28 years of age, had experienced considerable difficulty in breathing through the left nostril ever since the age of 6 years. Upon examination the inferior turbinated was found to be greatly enlarged and divided into two lobes, which almost completely filled up the cavity.

DISEASES OF THE ANTERIOR NASAL CAVITIES.

Caseous Coryza.—Potiquet, of Paris,[100 Feb.] in reviewing the cases so far reported, attacks the opinion of Duplay and others, and concludes that the term "caseous coryza" is an artificial conception, due to errors of diagnosis or inexact appreciation of facts. Cozzolino[37 Oct.] characterizes as erroneous the conclusions of Potiquet, mentioned above, and also those of Bories, of Montauban,[9 Oct.] who ascribes the disorder to necrobiotic degeneration of old polypoid growths, brought about by pressure in the diseased fossa. Histological examination of the products showed them to consist of the same elements as those found in cholesteatomatous masses of the tympanum and mastoid cells, to which scrofulous subjects were especially liable. He therefore suggests for the affection the term of *cholesteatomatous rhinitis.*

Potter, of Buffalo,[11, Mar.] states that about 2 per cent. of all his cases of acute rhinitis have been membranous,—a frequency that seems somewhat extraordinary when the rarity of the affection is considered. The unity of croupous and diphtheritic inflammations upon which the author insists would suggest that some, at least, of the cases alluded to might have been diphtheritic,—a mild type of the affection unaccompanied by much general manifestation. Bischofswerder[158, B.10, H.2] reports 3 cases occurring in children, 4½, 6, and 13 years of age, respectively. It seemed to present no analogy whatever with diphtheria or any other infectious malady, the initiative process being an ordinary rhinitis. Antiseptic and slightly astringent solutions brought about a cure in a few days. Gluck, of Omaha, Neb.,[59, Apr. 27] and Chapin, of New York,[9, July 6] also report cases. A peculiarity of the disorder is that the membrane failed, according to Potter and Gluck, to respond to the contracting action of cocaine, though causing local numbness. The last writer states that atropine applied locally acted as a local sedative, caused contraction, and checked exudation immediately.

Seifert[69, Aug. 3] relates an instance of death from a disorder presenting great analogy with the disease in question. The patient, a man aged 71, was in the advanced stage of pneumonia, when a fibrinous exudation occurred on the mucous membrane of the bronchi, trachea, larynx, pharynx, and nose. Tracheotomy was of no avail, death occurring twenty-four hours after the operation. The microscopic preparations showed merely a fibrinous exudation upon intact epithelium, by no means a diphtheritic pseudo-membrane. The only micro-organisms were colonies of cocci.

Acute Rhinitis.—Le Roy Dibble, of Kansas City,[102, Feb.] calls attention to the frequent presence of hyperidrosis of the feet in persons who are subject to catarrhal affections of the upper air-passages, and insists on the importance of strict attention in this direction in the treatment of this class of disorders.

S. Wilton Hope[2, Nov. 9] recommends the administration of salicylic acid, 20 grains (1.34 grammes) in liquor ammoniæ acetatis, three or four times a day. The attack soon passes off, and the frequent sequel, cough, is avoided.

Simple Chronic Rhinitis.—Rankin, of Pittsburg, Pa.,[678, Sept.] notes the following effects of natural gas upon the upper air-passages: Dryness of the throat and nares, followed by a free discharge of muco-purulent matter from these cavities. Then the dryness recurs, sometimes extending to the larynx and producing hoarseness. Examination by mirror shows nasal and pharyngeal congestion, with hyperæsthesia, promptly relieved by a 4-per-cent. solution of cocaine, followed by vaseline to the throat and nares.

Hypertrophic Rhinitis.—Spencer Watson[22 Dec. 19,'88] reports 3 cases of voluminous hypertrophy so fimbriated, irregular of surface, as to resemble papillomata. He removed them by a ring-knife passed through the anterior cavities, and engaged over the growth by the finger passed up behind the soft palate. Of interest in this connection is a paper by Seiss, of Philadelphia,[5 Feb.] who, after ably reviewing the present state of our knowledge of the pathology of hypertrophic rhinitis, which he proposes to call "intra-nasal sclerosis," alludes to hypertrophic papillæ which form after the changes in the epithelial layer have taken place, and which he has never seen noticed by other writers. These multiple papillomata are of minute size and spring from the surface of the turbinated tissue, and present the same structure as the typical papilloma. They may undergo atrophy or persist indefinitely. Our Paris corresponding editor, A. Gouguenheim, reports that Barbier, of Lyons,[1204] considers the title "hypertrophic rhinitis" as absolutely false anatomically, and suggests instead "diffused myxangioma of the mucous membrane of the turbinated bones." He also alludes to the papillomatous localized enlargements of the membrane, but ascribes them to the presence of greatly enlarged capillaries, and considers that a certain analogy exists between these growths and ordinary myxomata. This analogy was likewise insisted upon by Chatellier,[426 '88] who gave considerable study to the histological aspects of hypertrophic rhinitis.

Scanes Spicer, of London,[2 Sept. 14] in a paper on the influence of throat and nose affections in children, in relation to certain derangements of sleep, temper, spirits, energy, intellectual power, and other brain functions, summed up his conclusions as follows: 1. That certain nose and throat affections in children were among the special causes of derangements of sleep, temper, spirits, energy, intellectual power, and other functions of the nervous system. 2. That long-standing derangement of these functions in the growing child implied a defect in the nutrition of the tissues, which would leave its mark on the nervous and mental faculties of the grown adult. 3. That if no sufficient cause of derangement of the above functions could be discovered elsewhere in the economy, the condition of the nose, naso-pharynx, and throat should not be dismissed without examination and consideration. 4. That the naso-pharyngeal affections capable of causing the above derangements were principally chronic catarrh, with erectile and hypertrophied condition of the mucous membrane, post-nasal adenoid vegetations, and enlarged tonsils. 5. That many of the above nervous derangements rapidly disappeared, and that others were ameliorated in many cases by the cure of the local nose and throat disorder.

Major, of Montreal,[1 Aug.10] basing himself on a number of clinical observations in which the cases had failed to improve under the treatment of competent dermatologists, suggested that a definite relation existed between many cases of erythema and erysipelas occurring on the nose or in its neighborhood and inflammatory conditions within the nasal chambers, especially when they are productive of pressure. Four cases are mentioned in which intranasal treatment of the stenosis, occurring in the course of the affection, at once induced improvement, followed by recovery. Knight, of Boston,[1 Aug.10] in the same connection, alluded to necrosis, which he frequently finds acting as the primary etiological factor.

Holbrook Curtis, of New York,[61 Aug.3] by a tabulation of cases, demonstrated that nearly all patients with stenosis were anæmic, the percentage of oxyhæmoglobin being only about one-half that of normal blood. In his experiments he had used the hæmatoscope of Hénocque, and had again tested the blood after several weeks had elapsed. The conclusions arrived at were that the increase of oxyhæmoglobin in the blood after operations on the septum is directly proportional to the relief afforded an impeded nasal respiration.

Sattler, of Cincinnati,[53 Nov.2] mentions a case of almost complete nasal stenosis produced by the use of the galvano-cautery.

Our London collaborator, N. Wolfenden, reports that Ad. Bronner,[11 Dec.] in an article "On Some Relations Between the Diseases of the Nose and Eye," calls attention to the importance of examining into nasal conditions in order to effect a cure of such eye conditions as epiphora (nearly always associated with hypertrophic rhinitis), mucocele or abscess of the lachrymal sac, which may give rise to epiphora, conjunctivitis, keratitis, and phlyctenular ophthalmia. In most cases of ozæna there is epiphora and conjunctivitis and corneal ulcers. Muscular asthenopia, with normal vision and accommodation, also arises from hypertrophic rhinitis and post-nasal growths. Tumors in the nares, frontal or maxillary sinuses, or empyema of the sinuses, often give rise to exophthalmus. Ziem, of Danzig,[69, Jan. 31] describes 4 cases in which nasal and antral disease caused marked diminution of the field of vision, disorders of refraction being also present. Four illustrative diagrams are shown.

A case of chronic lymphatic œdema of the lip coincident with nasal pressure—a very rare condition—is reported by Jonathan Wright, of New York,[59, July 20] in which treatment of the nose relieved all symptoms.

A. Ruault, of Paris,[286, No. 7, '89] states that he has occasionally observed, in the course of hypertrophic rhinitis, marked spasm of the glottis. One of the cases mentioned had already been reported by Sourdrille,[1237] a pupil of Gouguenheim.

Suchannek, of Zurich,[214, May 1] describes his experience with the sozoiodolates of potassium, sodium, zinc, and mercury in nasal disease. His observations agree with those of Fritsche and Seifert in being very favorable to the new drugs; in particular, the writer found that sozoiodolate of potassium in the form of powder, mixed with talc (1 to 1 or 2), is a valuable nasal insufflation in cases of chronic rhinitis with profuse discharge. Sozoiodolate of zinc, mixed with talc in the proportion of 1 to from 12.5 to 7.5, is said to be an active stimulant of the nasal glands, and hence proves of great service in chronic hypertrophic rhinitis associated with scanty secretion and swelling of the lower turbinated bodies. Carl Stern[1205] found 15 cases of excessive secretion with secondary eczema narium to be greatly benefited by sozoiodol of zinc in powder, administered with talc as excipient. Holste, of Göttingen,[4, July 20] has used aluminium acetico-tartaricum in catarrhal disorders, and found it beneficial, although exceedingly irritating when abrasions were present. McGahan, of Chattanooga,[760, Nov. 9] employs with advantage the hydragogue effect of glycerin to reduce nasal hypertrophies. The cavity having been thoroughly cleansed, he applies a tampon soaked in a solution of glycerin, 1 part to 4 parts of water, leaving this *in situ* from one to four hours. He gradually increases the strength of the solution until equal parts of water and glycerin are used. Astier[35 Feb., 7] has employed lactic acid with satisfactory results. The solution, 10 grammes (2½ drachms) to 15 grammes (½ ounce) of water, is applied with cotton pledget to the whole extent of the turbinated body, this being repeated every three days, or daily if the secondary inflammation is insignificant. It modifies secreting surfaces advantageously.

Atrophic Rhinitis.—A study of fragments of mucous membrane from a case of ozæna has shown Schuchardt, of Halle,[8 May] that it was devoid of glands, and transformed either into granular or cicatricial tissue, while presenting ten or twelve layers of pavement epithelium. The cells of the upper layer were quite analogous to those of the epidermis. This epidermoidal tissue increases more and more, and a mass of dead epithelial cells is formed, which putrefies. According to Jïrmünsky,[11 Sept.] the primary cause of atrophic rhinitis should be sought in arrest of development of the turbinated bodies. The membrane is then apt to discharge an anomalous mucus which readily decomposes under the influence of probably specific microbes, which find therein a favorable soil for their growth. Jïrmünsky bases this supposition upon a number of cases (children) belonging to the same family, in whom atrophic rhinitis had developed without preceding hypertrophy.

Hartman, of Baltimore,[1] gave his experience with the treatment of atrophic rhinitis by the galvanic current in 21 cases. Fourteen were cured, 5 were still under treatment, and 2 failed to return. The method employed was that suggested by Delavan, the positive pole being applied to the nape of the neck by a sponge electrode, and the negative to the nasal mucous membrane by means of pledgets of absorbent cotton wrapped on insulated copper wire and well moistened before the application. The strength of the current should be exceedingly mild at first, but it may be gradually increased after several applications. The length of the application should vary in different patients, some bearing the current from ten to fifteen minutes, others only four or five. The nasal membrane should be thoroughly cleansed before each sitting. Three or four sittings per week will usually suffice. Hartman prefers the chloride-of-silver batteries.

Our corresponding editor, F. Massei, of Naples, informs us that Ferreri[889 Dec., '88] recommends creasote, which he found to be well borne and productive of but slight reaction if used carefully. He employs the liquid form with glycerin, equal parts. Bouchut extols a snuff composed of the subchloride of mercury 1 part, oxide of mercury 1, and pulverized sugar 20 parts. Ebstein[69 No.6] reports satisfactory results with balsam of Peru. The membrane is painted every day with the medicament, and a plug of cotton-wool soaked in it is left in the deep parts of the nose. Potter, of Buffalo,[61 Aug.3] recommends menthol in solution in oleum petrolina.

Syphilitic Rhinitis.—J. N. Mackenzie, of Baltimore,[11 Apr.] calls attention to the fibroid degeneration occurring in the nose, as it does in the larynx, in the later stages of tertiary syphilis. The turbinated bodies are the most frequently affected, and become very much enlarged, dense, hard, whitish, yellow, or red; being converted, after a time, from sessile to pedunculated growths,—in other words, true fibroid polypi. Sections of the growths show more or less complete conversion of the turbinated body affected into fibrous tissue, while cells and glands are either inconspicuous or obliterated. As the growths sometimes ulcerate, care should be taken not to confound them with gummatous infiltration.

Michelson[404 No. [illegible]] suggests the preliminary administration of medium doses of iodide of potassium when the tumefaction of the cavities renders a satisfactory examination difficult. He attaches importance to a longitudinal disposition of the furrows formed by the ulceration, tubercular ulcerations being rounded and irregular.

J. E. Nichols, of New York,[1 Aug.24] presented to the laryngological section of the Academy of Medicine a case of syphilitic adhesion of the tongue and soft palate to the posterior wall of the pharynx. The use of œsophageal bougies, introduced occasionally, as is usually done, afforded no relief, but great benefit followed their very frequent introduction (sixteen times each week). In the course of a discussion on the subject of surgical measures, Goodwillie stated that he had obtained excellent results by slowly separating the coherent parts by means of a knife, but little work being done at a time to avoid ulceration of the soft secondary tissue. The preservation of this secondary tissue—an important element in the healing process—led him to avoid galvano-cautery.

De Blois, of Boston,[1 Nov.9] calls attention to his poor results in operative procedures during the activity of the ulcerative lesions of syphilis, the vitality of the parts at that time appearing to be much more feeble. But when, through the action of medicaments, the ulceration is apparently arrested, it is the proper time to endeavor to correct or prevent deformities. In removing necrosed portions of the hard palate with the drill, burr, or trephine, it seems advisable not to perforate the bone; for, not only would a fistulous opening be very apt to follow, but, should this not be the case, there would be much more scar-contraction than if the outline of the bony parts were left.

Jarvis, of New York,[60, Feb. 2] describes a remarkably interesting case of nasal caries, complicated with meningitis, successfully treated by means of the surgical drill. The meningeal complication verified by Loomis was first reduced with 1-drachm (4 grammes) doses of iodide of potassium three times a day, and the operative procedures carried out as soon as the active symptoms had subsided. The rarity of the concurrence of nasal syphilis with meningitis as a complication is shown by the result obtained by a diligent search in the literature of the subject, Trousseau's case being the only one that Jarvis could find.

Nasal Tuberculosis.—Juffinger, of Vienna,[8, Mar. 28] described a case of recurrent tuberculosis of the nasal mucous membrane occurring in a woman, aged 21 years, twelve of whose brothers and sisters had died with pulmonary disease. The tumor obstructed the right nostril, and was found to contain tubercle bacilli. Nodules of lupus were also found on the neck and the cheek. Hajek, of Vienna,[57, Jan. 6] also reported a case in a man, aged 30 years, in which a purulent discharge was found to originate from a growth the size of a hazel-nut, situated in the right nostril, over the cartilaginous septum. Iodide of potassium proving ineffectual, four examinations for tubercle bacilli were made, which, however, were negative. Another tumor of the same character being found in the nasopharynx, an ulcerated spot at its upper portion was also examined, this part alone of the entire mass which had been excised showing the tubercle bacillus. Hajek alluded to some recent investigations in which it became evident that ulcerous processes in the nose of young persons pointed more frequently to tuberculosis than had hitherto been suggested. An interesting case is also reported by Luc, of Paris,[286, Feb.] in which two extensive ulcerations in the pharynx and nose were completely mastered by the thorough use of the curette. He wisely recommended energetic measures in all such cases. Further cases are described by Cresswell Baber.[2, June 23]

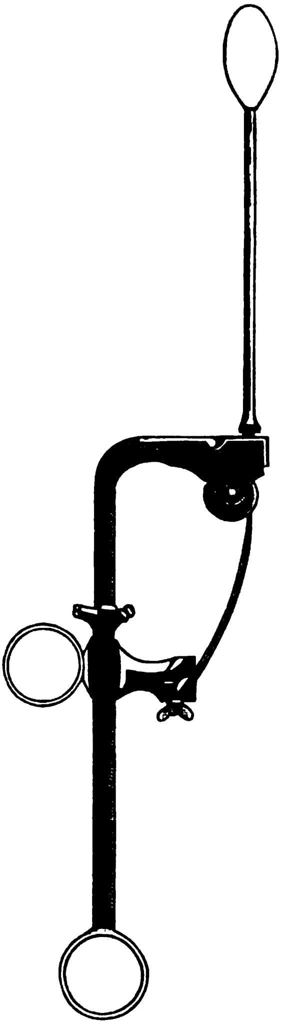
Lupus.—J. Middlemass Hunt, of Liverpool,[11, Sept.] wrote an excellent review of the subject, in which he calls attention to the painlessness of the ulceration as a striking feature. He then describes 6 cases in his practice, one of which, a child, died of acute miliary tuberculosis. Another case was described by Wagnier, of Lille (report of Gouguenheim, corresponding editor), in which the affection involved the turbinated bodies and the septum. Inoculation in rabbits demonstrated the correctness of the diagnosis. Galvano-cautery and lactic acid rapidly cured the trouble.

Raulin, of Bordeaux,[1206] in an able thesis, after reviewing the different theories propounded so far, shows that the determining cause is the introduction of the Koch bacillus into the nasal membrane. Hajek[8, Dec. 6, '88] cites a case in which thorough scraping and subsequent cauterization of all affected parts did not prevent recurrence, which followed in a few weeks. Peaucellier, of Amiens,[230, June] reports a successful case in which he used the treatment recommended by Vidal, linear and parallel scarifications of the ulcer, the knife being made to penetrate beyond its inferior limits. The curative process is due to the reactionary inflammation.

Nasal Polypi.—Schiffers, of Liége, collaborator, read a paper before the International Congress of Laryngology and Otology, in which he showed the transformations that can occur in a myxoma under favorable conditions. Change from the benign to the malignant state may be considered as being exclusively limited to subjects past the fiftieth year, and especially when the neoplasms are located on the septum, the vault, or the floor. Schiffers shows microscopical preparations of sarcomata, showing the successive gradations of the transformation from myxoma to sarcoma. These specimens were obtained from patients aged, respectively, 67 and 72 years. Casselberry, of Chicago,[61, Mar. 16] in an instructive paper, in which he presents a *résumé* of the recent advances on the etiology of polypi, expresses his belief that necrosing ethmoiditis may occur without polypus, while the latter may also be present without pre:rosis. This opinion, based upon careful examinations, disagrees healin that of Woakes, who stated that "when polypus exists De is also present." Another interesting point in the paper is operative of a case in which incrustation and infiltration of the growth with calcareous deposits caused it to resemble an osteoma, excised portions resembling thick egg-shell.

Foucher, of Montreal,[1207] introduced a polypus snare resembling greatly that of Bosworth. The handle of the instrument, instead of being oblique, as regards the staff, lies parallel with it, a right-angle support for the latter bringing the instrument outside of the line of vision while insuring more steadiness in the cavity itself. Labit, of Bordeaux,[730 Jan.] reports a case in which purulent catarrh of the frontal sinus and necrosis of its orifice occurred as the result of instrumental removal of polypi from the latter region. This conclusion is probably erroneous, the necrosis being most likely the primary factor.

Sarcoma.—Bryant, of New York,[1 May 11] reported to the New York Surgical Society a very interesting case of extensive sarcoma of the vault in which, the snare and cautery having proved ineffectual, he ligated both external carotids with a view to diminish the rapidity of the development. At the end of a week all pain had ceased and the size of the growth had very greatly diminished. By means of the snare and carbolic acid it was further decreased in size, and thorough operation was to be undertaken unless retrogression, which was progressing favorably at last accounts, should not continue. The loss of blood attending a preliminary removal of the superior maxilla was also shown to have been reduced to a minimum in the same case. Wyeth called attention to the fact that he had been struck by the variations sometimes occurring in the origins of the secondary arteries supplying the tonsils and the back part of the pharynx, and that it would therefore be well to examine into the particular arrangement of the arteries existing in each case as soon as they



Foucher's Polypus Forceps. (Monograph.)

were exposed. Bryant insisted on the value of bilateral ligation on account of the mortality from immediate loss of blood during removal of pharyngeal growths, which is thus prevented without unusual danger to the patient.

In a case of sarcoma, followed by fatal purulent meningitis, Orthmann,[4 Mar. 11] of Königsberg, found the diplococcus of Fraenkel.

Ollier, of Lyons,[211 Dec. 3, '90] raises his voice against the general practice of removing small portions of a growth in as many sittings, which, he says, exposes the patient to a much greater likelihood of recurrence, while the operation can only and at best be imperfectly performed, through inability to properly see and reach the parts. He strongly advocates the operation proposed by himself twenty-five years ago,—vertical and bilateral osteotomy (the nose being separated from the face down to within a short distance of its lower portion and doubled down over the upper lip),—which enables the operator to reach every attachment of the growth. In a large number of cases that he had operated he had noticed that recurrence was least likely to occur in hard neoplasms.

Major, of Montreal,[282 Feb.] exhibited before the Montreal Medico-Chirurgical Society a specimen from a case of spindle-cell sarcoma of the triangular cartilage. The tumor, which had attained the size of a pigeon's egg, had been removed with the snare and its base destroyed by the galvano-cautery. Major intended to punch out the portion of the septum involved in case of recurrence, but this had not yet taken place four months after the operation.

Heymann, of Berlin,[136 Mar. 16] reported a case of rapidly-recurring polypi, which finally became complicated with a dense, sessile, grayish-black tumor of the septum. The growth, upon removal (by galvano-cautery), proved to be a melanotic sarcoma. It had not recurred one year after the operation.

Papilloma.—Noquet, of Lille,[181 Sept.] after alluding to the rarity of this growth in the nose, reported a case in which it was attached to the anterior portion of the floor, and, being fully as large as a blackberry, completely obstructed the nostril. The neoplasm was found to be a true papilloma, resembling greatly the rapidly-developing cauliflower growths of the penis. Lacoarret, of Salies-de-Béarn,[136 Oct.] also reports 2 cases, in one of which asthma was produced by reflex action. He closes his articles with the following conclusions: Nasal papillomata are much more rare than is generally made to appear by some authors, who are influenced by the erroneous deductions of Hopmann and other writers, who did not properly differentiate true papillomata from other neoplasms. To do this the microscope is absolutely necessary. The history of papillomata as presented in the majority of text-books is erroneous. (Report of Gouguenheim, corresponding editor, of Paris.)

Fletcher Ingals, of Chicago,[1, Sept. 21] records an interesting case of recurrent growth of nostrils, which, examined microscopically by W. S. Haines, was reported to be a papilloma.

Von Bünger, of Halle,[69, Aug. 29] describes an extensive keratoid papillary growth of the upper portion of the nasal cavities, which completely occluded them, and which was found, upon removal, to be as large as a hen's egg. It was very hard and white in color. Microscopical examination showed it to be a so-called verruca cancrosa. The author found but 3 other cases in the literature of the subject. Gomperz[385, No. 1; 11, June] reports a case of soft fibro-papilloma of the inferior meatus combined with otitis media.

Our corresponding editor in Naples, Massei, reports the history of a congenital nasal growth in a child, 2 days old, seen by Cardone.[624, July] Great difficulty in breathing through the nose, asthma being also present. A growth of the volume of a cherry-stone was found in the right nostril and removed with forceps. It had a very thin pedicle and contained epithelial cells.

Fungi.—Schubert, of Nuremberg,[4, Sept. 10] reports 3 cases of nasal disease in which the aspergillus fumigatus (?) was found in the secretions, the latter differing from the secretions of ozæna only in the odor. Another case is reported—Siebenmann[312, Apr.]—in which the aspergillus was found, after death, in a mass of secretion from the naso-pharynx, which contained also the aspergillus nidulus. Michel[11, July] suggests that the condition was possibly a post-mortem one.

Larvæ in the Nose.—Pokrasoff[551, No. 12] reports an interesting case in a girl, aged 15 years, who had been sleeping in the fields. Violent headache, sleeplessness, and pain in the nasal cavities being experienced, her nostrils were found to contain live larvæ of Wohlfahrt's fly. These being removed, all symptoms disappeared.

Foreign Bodies and Rhinoliths.—The usual series of these cases appears in the year's literature. Though rather uninteresting through absence of novel features of scientific value in the cases reported, the subject seems an attractive one to writers. Cases have been reported by Kiesselbach,[34, Feb. 26] Maurer,[34, Mar. 5] Cresswell Baber,[771, May] Truckenbrod,[37, June] Major,[130, June] Lapthorn Smith,[130, June] M'Weeney,[16, May 1] F. Trester Smith,[207, Feb.] Miró,[11, Apr.] Schapringer,[150, June] Mitchell,[199, June] G. Oram Ring,[112, Aug.] J. Wright[59, Oct. 12] (who also reports 2 interesting cases of a tooth in the nose), Sokoloff,[11, Oct.] Baden[373] (report of Holger Mygind, corresponding editor, Copenhagen), Garel[37, July] (report of Gouguenheim, corresponding editor, Paris).

C. W. Dodd, of Wurzburg,[11, June] suggests an effective and painless method for the extraction of foreign bodies in the nasal cavities. The instrument consists of a soft-rubber tube, 1 foot (30 centimetres) long, with a rubber or wooden tip at the end, that will fill the well nostril. The other end of the tube being held in the physician's mouth, a hard blow causes the foreign body to fly out. As in the application of the Politzer bag, the soft palate must be closed, either by crying, in the case of a child, or by a mouthful of water swallowed at the same time, when the patient is an adult.

Congenital Occlusion.—B. Fraenkel, of Berlin,[69, Aug. 8] reported a case of complete bilateral occlusion of the nares in a youth of 18 years. The septum projected somewhat into the vault, and formed the centre of the bony wall which occluded the cavities, and which could be seen anteriorly as well as posteriorly, owing to atrophy of the turbinated bodies. Rolland, of Montreal,[122, Apr.] reported a case of congenital obstruction of the posterior nares, in which, contrary to the generality of cases, the perforation, executed in this case by means of the gouge and mallet, was not followed by recurrence of stenosis. Foucher[122, Apr.] considered the electric trephine a dangerous instrument for the penetration of bony occlusions, owing to the possibility of suddenly forcing the tip of the instrument into the tissues of the vault and seriously damaging them. C. H. Knight, of New York,[9, Nov. 10] reports 2 cases of bony congenital occlusion, one of which, a female aged 18 years, in whom the occlusion was unilateral, submitted to operation. This was done by means of the trephine. Although the patient was able to breathe with much more freedom, she experienced inconvenience from accumulation and drying up of secretions in the nostrils, which was not the case before. The author insists upon the practical advantage gained by examining the parts with the finger. Onodi, of Buda-Pesth,[4, No. 36; 11, Nov.] describes a case of occlusion due to senechiæ between the septum and lower turbinated body. A part of the obstruction was osseous, while the rest was membranous. Michael, in reporting this case, alludes to a similar case in his practice. Eulenstein, of Frankfort,[69 No.39; 11 Nov] reports a case in which two osseous septa, covered with membrane, closed the posterior nasal apertures. Perforation, by drilling and enlargement of the opening with the saw and forceps, resulted in permanent recovery.

Osteoma.—Our corresponding editor in Paris, Gouguenheim, reports that Montaz, of Grenoble,[100 Dec.6,11,'88] described a case, occurring in a man 52 years of age, in which the growth, shaped somewhat like a dumb-bell, presented a prominence within the left nostril, deviating the septum toward the right, while its other extremity showed externally in the region of the lachrymal sac. An incision through the skin exposed the external end of the mass, which was then seized with forceps and extracted as would have been a tooth, this being rendered possible by its loose attachment. An opening between the superior meatus and external parts was thus established, which soon closed, however, through approximation of its sides. Montaz is inclined to consider this loose attachment of osteomata as more likely to occur after middle life,—belief supported by the literature of the subject and presenting a marked degree of importance when surgical measures are to be adopted.

F. Kammerer, of New York,[96 Aug.] described a case operated by Maas, of Wurzburg, which presented the peculiarity of being attached to the frontal besides the ethmoid (its usual origin) bones, separation from these attachments having rendered the growth movable in the nasal cavity. Though the nose had been opened by an incision along the ridge to admit of thorough enucleation, the opening thus made had to be enlarged to render extraction of the growth, which weighed 2¼ ounces (70 grammes), possible. It was a pure ivory osteoma, no nucleus of spongy tissue being discernible.

Obstruction of Nostrils.—E. Roughton, of London,[2 Feb.16] having seen a case in which the alæ of the nose were forced inwardly by inspiration, suggests this phenomenon as a cause of obstruction seldom recognized, through the fact that the nasal speculum holds the nostril opened during examination. The part principally at fault is the band of tissue at the junction of the lower lateral cartilage of the nose and the bony margin of the anterior nares, its position being marked externally by the depression usually seen immediately above the lower expanded part of the nose.

Lympho-hæmatoma.—Our corresponding editor, Gouguenheim, reports an interesting case published by Strazza, of Genoa,[37 Dec.,'88] in which, as the result of a blow upon the nose, a flexible, reddish mass presented itself on the left side of the septum, causing marked obstruction, but no pain. Puncture and aspiration with a Pravaz syringe withdrew a quantity of sero-sanguinolent liquid, followed by collapse of the neoplasm, which, however, soon refilled. After three aspirations no recurrence took place. The author considers the case one of lympho-hæmatoma, described by Gussenbauer.[1075 '81]

Hæmatoma.—A case of this infrequent condition is related by Thorner, of Cincinnati,[9 May 4] in which refusal on the part of the patient to submit to opening of the sac a second time resulted in the formation of an abscess, with marked general symptoms. An incision across the swelling gave passage to a large amount of pus, and disclosed a perforation the size of a small bean through the cartilaginous septum.

Epistaxis.—Geneuil[2 Dec.22,'88] has succeeded in checking epistaxis by means of injections of lemon-juice after every kind of hæmostatic had failed. He proceeds as follows: After washing the nostril with fresh water, with a glass urethral syringe he injects as much freshly-squeezed lemon-juice as the syringe will hold. In one or two minutes the blood ceases to flow. One injection is usually sufficient. Geneuil tried a concentrated solution of citric acid, but without effect. He does not, therefore, attribute the effects of the lemon-juice to the citric acid, but to the combined substances which the juice contains. Dujardin-Beaumetz[67 Dec.30,'88] reports a striking case in which the method of Geneuil was sufficiently effective to take the place of tamponing. J. W. McCoy, of New York,[59 Aug.10] recommends a flexible rubber tube, one end of which projects into a soft-rubber bag. The bag, being introduced into the nostril, is filled with water, the other end of the tube being then closed by means of a stop-cock. The filled bag thus forms a cushion, which adjusts itself to the surrounding parts, and exerts pressure on the bleeding spot. A case of death is reported[59 Dec.22,'88] in a young man subject to the hæmorrhagic diathesis.

Hay Fever.—Woolen, of Indianapolis,[224 Sept. 28] considers the region of the anterior tips of the inferior turbinated bones as the seat of hypertrophies, which are the essential pathological factors of hay fever, while the posterior tip hypertrophies are the essential pathological factors of asthma and its congeners. These do not become factors in hay fever and asthma, however, unless there be a special dyscrasia. Natier, of Paris,[1208] states that, although the affection is not considered as common in France, it would prove so if sought after. He agrees with American rhinologists as to the treatment by galvano-cautery and the use of cocaine as a palliative. Gouguenheim, corresponding editor, who reports the above, recognizes the value of cocaine, but considers frequent applications and the internal administration of nervines (bromides, antipyrin, quinine, etc.) as necessary to obtain the best effects. J. I. Taylor, of Memphis,[74 Nov.] reports a number of cases treated successfully by cauterization of the nasal membrane.

H. C. Wood, of Philadelphia,[80 Jan.] recommends bougies of cocoa-butter, containing 1 grain (65 milligrammes) of the hydrochlorate of cocaine and $\frac{1}{120}$ grain (0.0005 gramme) of atropine, forcibly introduced between the septum and swollen turbinated bodies. The patient should lie down to do this, and remain in the recumbent position for awhile. William Hill, of London,[6 June 22] has had marked success with a 10- or 20-per-cent. solution of menthol in almond- or olive- oil, and applied to the sensitive areas of the mucous membrane by means of a brush or coarse spray.

Rhinoscleroma.—Stepanow,[385 No. 1; 11 Jan.] having inoculated portions of neoplasm and cultures of the micro-organism of this disease into rabbits' eyes, concludes from the results obtained in all cases that rhinoscleroma is an infectious disease due to the presence of Fritsche's microbe. Massei, of Naples, corresponding editor, reports some etiological studies upon rhinoscleroma by Zagari,[537 No. 4] who agrees with Mibelli that it is possible to cultivate artificially a micro-organism which resembles that histologically observed by Cornil and Alvares, and concludes (1) that Paltauf and Eiselberg, having cultivated a capsulated micro-organism which was pathogenic for laboratory animals, did not obtain the bacillus of rhinoscleroma; (2) that the etiology of the disease is not evident, as time only can show if the so-called bacillus of Cornil and Alvares cannot be considered as of a conventional denomination. An able review of this affection is published by Wolkowitsch, of Kiew,[755] which, however, contains nothing particularly new.

Anosmia.—In order to confirm the well-known relation between the nasal function and the genital organs, Massei, corresponding editor, Naples, states that Fiano[505, Mar.] reported a case of a young lady, 20 years old, in whom, during the menstrual period, there was a disagreeable sensation of burning in the nose with anosmia. The direct examination showed hyperæmia. Local treatment to remedy an existing hypertrophic rhinitis improved the patient. Massei refers also to the case of anosmia followed by a complete recovery which Felici[624, Sept.] described, which he considers interesting, because the patient (a lady) was syphilitic, the nose being filled with crusts and ulcerations. The sense of smell returned with appropriate specific treatment, cleaning, and gradual exercise with substances of different odoriferous power.

DISEASES OF THE SEPTUM.

Deviation.—Garrigou-Désarènes, of Paris,[24, Feb. 8] describes a new instrument (shown on page 21) which he has devised, composed of two septal plates, which, mounted on a sliding-shaft, can be approximated with much power by means of a thumb-screw. The septum, seized between the two nose-pieces, is crushed into shape, as it were, the instrument being left *in situ* about five minutes. Antiseptic irrigations are then made, and small laminaria are introduced to keep the septum in its new position. The operation is only painful when the cartilage is being fractured.

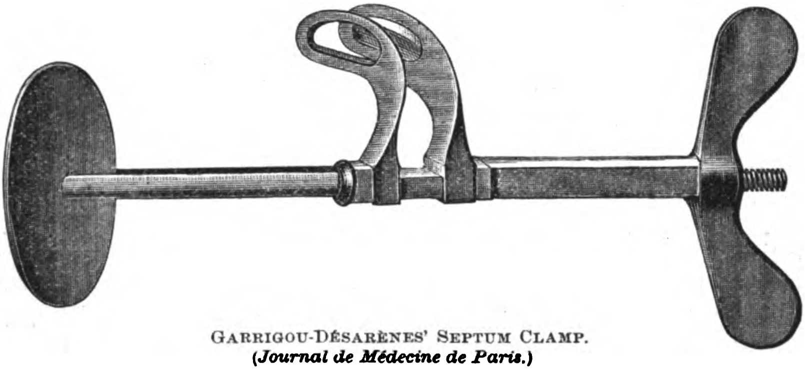
John B. Roberts[760, June 29] gives a very interesting review of the method, including his own, of straightening crooked and otherwise deformed noses. Though the paper contains nothing new, it will serve greatly to facilitate research. The same may be said of an article by W. Peyre Porcher, of Charleston.[8, July]

Trendelenburg[4, Sept. 16] compresses the projecting turbinated bone under chloroform narcosis, and holds it in that position by means of iodoform tampons. He then straightens the septum with Adam's forceps. Krieg, of Stuttgart,[4, Aug. 6] has performed resection of the quadrangular cartilage in 23 cases for deviation with advantageous results.

Thorner, of Cincinnati,[53, May 18] reports a case of marked tinnitus aurium, in which was a deflected septum and complete closure of the right nostril, partly by a web and partly by a deflected septum, besides slight obstruction of the left naris. Surgical treatment of these conditions caused the tinnitus to gradually disappear.

Perforation.—Thrasher, of Cincinnati,[53, Oct.,'86] reports a series of 16 cases of perforation of the septum, 11 of which presented no evidence of either acquired or inherited syphilis. [I have also observed a number of such cases, in which not only syphilis could not be considered as primary cause, but in individuals who followed occupations in which no predilection to the trouble was afforded, such as in the case of canners, etc. Picking the mucous membrane appeared to be the only cause, the denuded perichondrium quickly breaking down through deficient nutrition after erosion of its covering.—Ed.]

Abscess of the Septum.—Our corresponding editor, Gouguenheim, of Paris, writes us that he has observed 2 cases of abscess of the septum, both patients being women. In the one it could be traced to a fall; in the other no cause could be found. Though both recovered comparatively soon, depression below the level of the nasal bones occurred in the one. Was the luxation of the quadrangular at its junction with the osseous septum? The question remains a mooted one.



Garrigou-Désarènes' Septum Clamp.
(Journal de Médecine de Paris.)

Spurs of the Septum.—Chatellier, of Paris,[7, Jun.,'86] after a careful examination of removed pieces, says that the growths may either be cartilaginous or osteo-cartilaginous, and covered with mucous membrane, both bone and cartilage being normal. Gouguenheim, corresponding editor, who reports these observations, states that he has been able to satisfy himself that thickened mucous membrane formed the greater part of the projection, bone and cartilage coming in for a much smaller share.

G. B. Hope, of New York,[1 May 4] presented to the New York Academy of Medicine an interesting case of complete bony occlusion of the anterior nares due to hyperostosis of the facial bones. The turbinated bones, however, were the most involved, and were being drilled away at the time of the reading.

J. Garel, of Lyons,[37 Oct.] reports 30 cases of nasal obstruction through thickening of the septum, in which electrolysis, Mish's method, described last year (ANNUAL, vol. iv, Sec. D, p. 18), was used with marked success.

Fibroma of the Septum.—Lefferts[9 Aug. 17] reports a case of fibroid tumor of the septum, no instance of which he had been able to find in literature. The neoplasm presented the usual appearances, though pedunculated by a small pedicle, and was situated just above the muco-cutaneous junction in the right nostril. It was removed by clipping the pedicle.

DISEASES OF THE NASO-PHARYNX.

Morgan, of Washington,[104 June 8] reports a case of supernumerary tonsil, microscopic examination of which showed that it differed from the ordinary hypertrophied tonsil and from the normal gland, in that the submucous connective tissue was immensely thickened and degenerated into a dense fibrous connective tissue. It also differed in being divided up into small lobes, the septa being formed by bands of connective tissue arising from the submucous connective tissue and by folds of the mucous membrane. Morgan concludes: 1. The lymphoid follicles of the soft palate and pharynx are liable to be aggregated, resembling in arrangement the faucial tonsils. 2. The condition is exceedingly rare, since, excepting the so-called "pharyngeal tonsil," but one case has been reported. 3. These lymphoid follicles are also liable to hypertrophy. 4. Such hypertrophies may occur oftener than is supposed. 5. The indications for operative interference in this condition are identical with those for the faucial tonsil.

Naso-Pharyngeal Catarrh.—J. N. Mackenzie, of Baltimore,[1 Oct. 8] after reviewing the objections against the theory of Tornwaldt, and stating that his clinical experience had not as yet enabled him to confirm this author's observations, presented the following conclusions as a result of his observations:—

1. The nasal pharynx is, in quite a large proportion of indi-

viduals, extremely sensitive to reflex-producing stimulation. 2. The areas chiefly involved are the posterior portions of the turbinated erectile tissue and various points along the upper and posterior portions of the the nasal pharynx. 3. In consequence of this extreme sensitiveness, a local pathological process, which in many persons would give rise to no reflex neuro-vascular changes, may awake a host of neurotic phenomena referable not only to the region primarily involved, but also to other and even remote organs of the body. These may include cough, asthma, and various neuralgic affections; or the local structural lesion may be the starting-point of various sympathetic affections of the respiratory tract. 4. That these classes of naso-pharyngeal neuroses are explicable on the same general principle laid down in the article on "Neuroses of the Nose," and the pathology of the nasal and post-nasal affections is, therefore, one and the same. 5. That the treatment should be carried out according to the general directions laid down in the article just mentioned. 6. That when morbid processes originate in the pharyngeal tonsil attention should not be directed to the bursa alone, but an endeavor should be made to extirpate the tonsil as far as possible in its entirety. 7. That while a favorable prognosis cannot be safely predicted by treatment of the bursa alone, extirpation of the pharyngeal tonsil often affords a most favorable prospect in long-standing cases of post-nasal trouble.

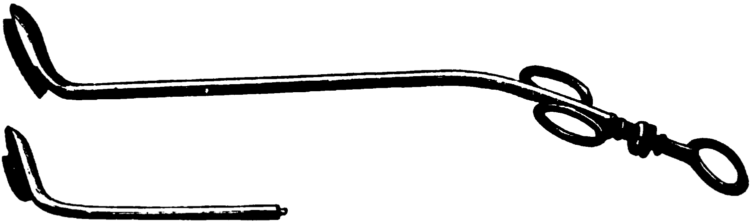
Raugé, of Nice,[14, Jan. 18] in an anatomical study based upon 20 dissections in the adult, states that he was unable to find in any of these the so-called pharyngeal bursa of Luschka, the only depression in the spot the bursa would otherwise occupy (the recessus medius) being but one of the many recesses with which the vault is furnished. Raugé, therefore, considers that it is not entitled to an isolated description, nor to the distinctive pathological characters given it by Tornwaldt.

Kafemann, of Königsberg,[1210; 11, Nov.] in a 60-page monograph, presents a general review of the subject, agreeing with Schwabach that the bursa cannot be considered as a special organ, and that it is but a recess between adenoid vegetations.

Our Paris corresponding editor, Gouguenheim, reports that Gellé[37, May] presented before the Société de Biologie an anatomical preparation in which the pharyngeal bursa was exceedingly marked, a central elevation in the vault forming its external aspect. An opening in the centre of the elevation gave passage to a viscid, glairy mucus, which caused the bursa to collapse, when emptied. Gellé believes this condition to be rare, and that it scarcely warrants the attention and isolated identity given it by Tornwaldt and his followers. The bursa is, nevertheless, occasionally present.

Cyst of Pharyngeal Bursa.—Wright, of Brooklyn,[9 July 13] reports a case of cyst of the bursa, reviewing at the same time, in a concise and able manner, the authentic cases so far reported, which are far from reaching the proportion published by Tornwaldt.[1209 '86]

Post-Nasal Catarrh.—Siebenmann, of Basel,[214 June 15] alludes to the extreme frequency of naso-pharyngeal catarrh in Basel and vicinity. The lighter forms are usually combined with hypertrophy of posterior portion of the septum and turbinated bones. The greater portion originates in the entire tonsil and not in the bursa pharyngea, which, in the sense of Mayer, Luschka, Tornwaldt, etc., does not exist. In his cases one-third presented cysts. He advocates the use of Gottstein's knife.



Brush for Ecouvillonnage of the Naso-Pharynx.
(Annales des Maladies de l'Oreille, etc.)

Gellé, of Paris,[37 July] extols the merits of rapid brushing of the pharyngeal vault in obstinate cases with the instrument shown above. He first washes the parts with an alkaline solution, then dips the brush in an alcoholic solution of boric acid. Introduced in the vault, the instrument is operated by giving the proximal end a to-and-fro motion, which is communicated to the brush. Pouchel[1215] recommends in the highest terms insufflation of pulverized boric acid.

Tumors of the Naso-Pharynx.—Clutton[6 Dec. 1, '88] removed, without external incision, a naso-pharyngeal tumor affecting the base of the skull, from a boy aged 14. The tumor, a soft fibroma, completely filled the naso-pharynx. It was removed with a cold snare and the point of attachment scraped with a sharp spoon. Recurrence took place in about a month, when the scraping was repeated much more extensively, masses of new growth together with bone being removed until the sphenoidal sinuses were reached. The vomer and rostrum were broken away with forceps, and the whole cavity freely exposed. There had been no recurrence after a lapse of more than two years.

Ingals, of Chicago,[61, Dec. 8,'88] reports in detail a case of fibroma of the naso-pharynx, upon which he operated with galvano-caustic snare and by electrolysis. He refers also to two other cases, and believes that when portions of the tumor are inaccessible to the écraseur, cautery, knife, or cutting-forceps, we should resort to electrolysis, successfully used by Lincoln and others, in the expectation of at least retarding the growth until the period of adolescence, when spontaneous cure may be effected.

A case of lympho-sarcoma of the pharynx is reported by Schnitzler, of Vienna,[57, Apr. 21] one of fibroma of the pharynx, by McLeod, of Calcutta,[206, Dec.,'88] and one of myxoma of the pharynx, by the same author.[206, Mar.]

Petrone[505, Nos. 18, 19] describes a teratoma which was extirpated from the postero-superior wall of the pharynx in a girl 6 months old. She experienced difficulty in suckling and breathing. The tumor was the size of a large cherry, had the appearance of skin, and was pedunculated. (Report of F. Massei, Naples, corresponding editor.)

Adenoid Vegetations.—White, of Richmond,[61, Aug. 3] out of 565 cases treated for naso-pharyngeal affections, found diseases of the middle ear in 197. Of the whole number, 134 had hypertrophy of the third tonsil, of whom 62 had impaired hearing,—a number equal to 20 per cent.

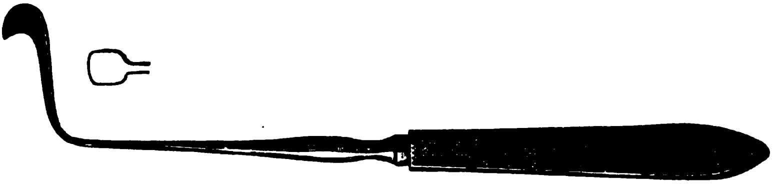
Delavan[1, Oct. 12] presents a series of interesting observations upon the diseases of the adenoid tissue at the vault. He believes that, while in the majority of cases adenoid hypertrophy originates during childhood, such is not always the case. Many cases do not develop until the age of puberty or thereafter, as is true also at the pharyngeal tonsil. This is particularly true in girls, and may be observed at any time up to middle life. Hypertrophy is often the result of a previous attack of diphtheria or scarlatina. Among adults, hypertrophy of an annoying character is often seen in women of 30 or thereabout, although the degree of hypertrophy may be moderate. An interesting phase of adenoid disease is that condition in which a temporary enlargment of the tissue of the vault takes place under special excitation, the enlargement subsiding with the removal of the cause. It appears to be analogous to the acute enlargements of the tonsils commonly seen in patients in whom these glands are irritable and liable to swell during attacks of cold. The writer proposes to call it "acute recurrent enlargement of the adenoid tissue at the vault of the pharynx."

Chronic hypertrophy is of two principal varieties. In the first the adenoid element predominates, while in the second the consistency of the growth is more firm by reason of the presence of an increased amount of fibrous tissue. The actual degree of hypertrophy present in a given case may be no criterion of the amount of occlusion or irritation which it may cause. The effects of occlusion of the nasal passages by these growths, existing from childhood, are apparent in the deformities of the bony structures of the nose and face often observed. Deviations of the septum are often due to this cause, and have been observed in very young children affected with pharyngeal adenoids. Since the presence of even a small amount of tissue may seriously affect the auditory apparatus, the complete and thorough removal of the growth is necessary. The patient should be carefully examined after the effects of the operation have subsided, to ascertain whether the pharynx has been thoroughly cleared. While, in the use of the curette, fragments of tissue have been known to fall into the larynx, such an accident may be avoided by the use of the forceps. Occlusion of the larynx may occur from the impaction of blood-clots, and should be avoided by the exercise of care and attention. In separating the mass of tissue seized by the forceps, the mass should be followed up by the finger of the operator, so that traction upon it may not result in laceration of the underlying mucous membrane. Hæmorrhage is uncommon; nevertheless, 5 cases are alluded to in which severe bleeding has occurred. The painful nature of the operation is insisted upon, and the use of anæsthetics urged in the more severe cases. Chloroform has the advantage of not exciting the troublesome secretion of viscid mucus often seen in the administration of ether. In the after-care of the patient, he should, as a rule, be kept in bed until the immediate effects of the operation have evidently subsided. Tonics should be given, especially iron and quinine. Finally, it must not be supposed that with the completion of the operation every possible benefit has been gained.

Krakauer, of Berlin,[4, Feb. 4] reviews the various methods for removing these growths, and presents a new form of instrument, shown below,—a curette intended to be hooked into the growths from before, pushed backward, the growths being then separated by traction downward.

The prevailing belief that adenoid vegetations are never present after the 30th year is shown to be incorrect by the case of a man, aged 65, upon whom Couetoux, of Nantes,[35, Dec. 13, '88] operated to cure a marked unilateral deafness. More evidence to this effect is adduced by J. Solis Cohen, of Philadelphia,[11, Feb.] who reports an interesting case in a lady of 70, otherwise healthy, except for the presence of an enlarged thyroid gland.

Major, of Montreal,[9, June 22] expressed his continued belief in the relation existing between nocturnal enuresis and mouth-breathing, —an opinion confirmed, since he first expressed it (1864), by Ziem, of Danzig, and others.



KRAKAUER'S CURETTE.
(*Berliner klin. Wochenschrift.*)

Lavrand, of Lille,[3, Sept. 26] alluding to the cases in which adenoid vegetations produced total deafness in young children, considers them a cause of deaf-mutism, while removal of the vegetations may act as a possible cure of the latter condition.

Wright Wilson, of London,[22, July 10] read a valuable paper before the British Laryngological Association based upon 235 cases which he had treated. The proportion as to sex was about equal. Ten cases presented deafness as the only symptom; in one there was mastoid abscess. He pointed out the importance of exploring the naso-pharynx in every case of deafness. In 10 of his cases the growths were at the sides or back of the pharynx, instead of springing from the vault, as is most usual. He explores the cavity with the index finger, pushes the lip between the molar teeth to prevent the child biting, and then, if necessary, at once introduces the forceps, repeating the process if required. He then leaves the patient lying on the sofa for half an hour, with instructions to call him if there should be any bleeding. All forms of exercise are forbidden for the rest of the day. Neglect of this precaution led in one or two cases to serious hæmorrhage. Of the 235 cases seen by him in 1886, 31 per cent. had concurrent disease of the middle ear. In rather more than 11.5 per cent. both tonsils were enlarged, and in about the same proportion only one tonsil was enlarged. In hospital practice, of 519 cases applying for disease of the middle ear and nasal obstruction, 235 (45 per cent.) had post-nasal growths.

Carl Michel, of Cologne,[60, No. 30; July 11] refers to the interference presented by disorders of the naso-pharynx, and especially hypertrophies, to the proper production of the voice. This is due to the unimpaired motility of the velum palate, the contraction of which is necessary when high notes are to be produced.

The presence of severe ptyalism in a case of adenoid vegetations led Couetoux, of Nantes,[35, Dec. 13, '88] to attribute this symptom to the latter in a number of cases in which both conditions were associated. Although worth recording, these observations, it must be said, were not controlled by operations.

J. A. White, of Richmond,[61, Nov. 23] lays stress upon the importance of relieving the vault of all glandular hypertrophies or vegetations in the treatment of naso-pharyngeal and naso-aural inflammatory processes, believing the latter to be the result of their presence and not the contrary, as generally believed. He adds interesting remarks on the relation between naso-pharyngeal disorders and disease of the middle ear.

Luc, of Paris,[17, May 26] having observed the recurrence of occlusion in cases in whom an operation, a couple of weeks before, had apparently cleared the post-nasal space, adduces as explanation that given by Châtelier, who ascribes the recurrence to sanguineous refilling of parts overlooked, which had been bled by the laceration of surrounding parts during the operation. To avoid this, Luc recommends thorough galvanic cauterization after each operation. Major, of Montreal,[282, Aug.] places his patient in the recumbent position, with shoulders elevated and head thrown back to prevent the entrance of blood into the larynx while operating. Dundas Grant, of London, in the course of a discussion,$^{11}_{\text{May}}$ stated that his method of operating is to scrape the adenoids together with the finger-nail until they lie in a clump in the vault. He then removes the mass instrumentally. William Hill, of London,$^{2}_{\text{Sept. 28}}$ alludes to the influence of post-nasal disorders in producing backwardness and stupidity in children, and extols the merits of naso-pharyngeal scarifications. Casselberry, of Chicago,$^{11}_{\text{Aug.}}$ referred to the importance of thoroughly eradicating adenoid vegetations. In 2 cases, in which portions of the mass had been left, the reflex symptoms, while greatly lessened, continued to recur.

Post-Nasal Polypi.—Wagnier, of Lille,$^{136}_{\text{June 15}}$ who, like French surgeons in general, renounces more and more the great operations and resections which were once much in vogue there for the cure of naso-pharyngeal polypus, suggests what he terms a novel method in the use of the galvanic loop, which consists in encircling the mass and burning sufficiently deep to cause loop and growth to become tightly connected. Traction on the neoplasm tears it out by the root, as it were, practically no pedicle being thus left. This is, of course, only applicable in pedunculated growths.

Annandale, of Edinburgh,$^{6}_{\text{Jan. 26}}$ describes a method of operating which he successfully carried out in 3 cases of naso-pharyngeal tumor, in which sufficiently effective work could not be done through natural channels. The steps of this operation are as follow: 1. The exposure of the anterior nares by freely dividing the mucous membrane connecting the upper lip and upper jaws, according to the plan of Raugé. 2. The division of the bony septum of the nose along its attachment to the jaw. 3. Incising the soft parts along the middle line of the hard palate, and then sawing through the alveolar margin of the upper jaw, and through the entire hard palate along the middle line. The soft palate may or may not require division in its middle line. The necessity for this depends on the size and attachments of the growth. 4. The forcible separation of the two jaws, and the introduction through the gap of the finger, periosteal scraper, or other similar instrument, with the view of separating secondary connections of the growth to the surrounding parts. 5. The removal of the growth from its primary site of origin by forceps, sharp spoon, cold snare, or the galvanic wire. 6. When the tumor has been removed, the introduction of some antiseptic plug. The jaws are brought together and secured by one wire suture and two or more horse-hair sutures through the soft part of the palate. Annandale relates 3 cases in which this operation was performed, and they all proved, as far as the removal of the growth was concerned, most satisfactory. (Report of Wolfenden, collaborator.)

Ollier, of Lyons, says our Paris corresponding editor, Gouguenheim, considers that naso-pharyngeal polypi have become much more scarce since rhinological therapeutics has reached a high standard. Gouguenheim alludes to the following reported cases: Ollier, ${}^{211}_{\text{Dec.9,'88}}$ Huertaux, of Nantes, ${}^{127}_{\text{May 9}}$ Poisson, ${}^{127}_{\text{Mar.9}}$ and Tellier, of Lyons, ${}^{211}_{\text{Aug.11}}$ who reported a case of naso-pharyngeal fibroma in a girl of 15. The case is interesting on account of the rarity of these growths in women.

REFLEX NEUROSES.

Von Stein, ${}^{580}_{\text{No.17}}$; ${}^{11}_{\text{Dec.}}$ of Moscow, terms coryza vaso dilatoria chronica, an affection observed by him in 5 cases, in which there is marked congestion of the mucous membrane on both sides, dryness, and occasionally a clear, transparent secretion. General symptoms, besides aprosexia and frontal headache, lead the author to consider the affection as due to vasomotor disturbance of central origin.

Eyes.—Trousseau reported, at the meeting of the Société d'Ophtalmologie, ${}^{11}_{\text{July}}$ a number of ocular reflex affections. A young girl 18 years of age was only cured of a blepharospasm, rebellious to all other treatment, by the ablation of numerous small nasal polypi. A lady 25 years of age has a blepharospasm every time that she has an attack of acute coryza. A man 35 years of age has been cured of an ophthalmic migraine by extirpation of a number of small polypi. There also exists a true nasal asthenopia, which only yields to treatment of the pituitary membrane. It is distinguished from other asthenopias by integrity of refraction, of the conjunctiva, and of the lachrymal ducts.

Ziem ${}^{4}_{\text{Sept.10}}$; ${}^{5}_{\text{Mar.}}$ refers to some instances of diminished field of vision due to intra-nasal diseases and to suppuration of the sphenoid cells and of the maxillary sinus, one of the latter being reported in minute detail. He does not refer this condition to reflex influence from the nasal obstruction, as many other observers have done, but to diminished aspiration of blood to the lungs and consequent disturbance in the venous and lymphatic circulation in the head and in the cerebrum. He is of the opinion that many other symptoms attributed to nasal reflex are to be similarly accounted for. He calls attention to glaucoma and to some other ocular affections from the same cause, which are submitted to useless operations in consequence of a want of appreciation of their true pathology. The anatomical conditions upon which Ziem bases his opinions are fully described. Among the few cases detailed is one of glaucoma cured by trephining the antrum and evacuating the pus.

Teeth.—Potter, of Buffalo,[170 Aug.] closes a paper on the influence of oral irritation in the production of diseases of the upper air-tract by the following conclusions: 1. Oral irritation is a factor in the causation of disease of the upper air-tract. 2. This irritation results from any disease or malformation of the teeth, and also from an incomplete and improper adaptation of fillings and plates. 3. Disease of the upper air-tract may be a causative factor in the production of the diseases of the teeth. 4. The recognition of the reflex influence of the diseases of these organs is an important step in their diagnosis and treatment.

Œsophagus.—Joal, of Mont Dore,[212 June] reports 9 cases of œsophagismus in which the disorder was found to originate in the nose.

Nervous Symptoms.—Lichwitz, of Bordeaux,[14 Sept.22] reports a case of trifacial neuralgia, another of facial spasm, 2 cases of spasmodic cough existing since childhood, and 1 of morning nausea which yielded to treatment of nasal disorders. Daly, of Pittsburgh,[11 Aug.] reports 25 cases, and Foster, of Kansas City,[102 Dec.,'88] 3 cases of neurasthenia, in which treatment of the nose induced complete recovery. Joal[14 Sept.22] speaks of equally satisfactory results in cases of nightmare, cephalalgia, vertigo, epistaxis, and skin eruption, in which the nasal disorder was the exciting cause.

Schneider, of Cologne,[4 Oct.28] reports 6 cases of epilepsy of nasal origin. Crossfield, of Hartford, Conn.,[61 Aug.3] reports 2 cases completely relieved by intra-nasal treatment.

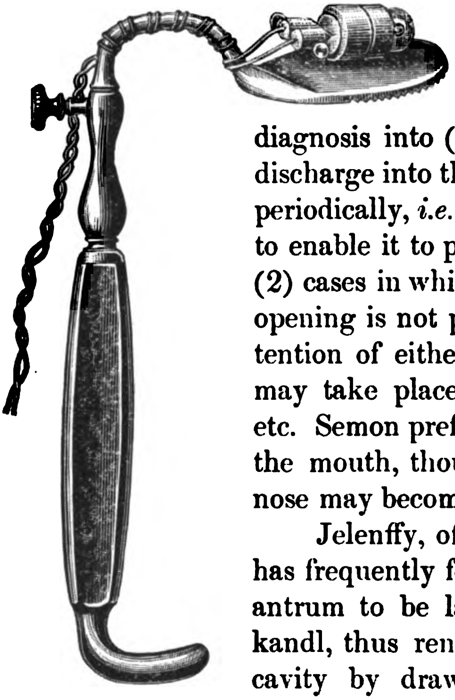
A. Peyer, of Munich,[34 Jan.15] reports 7 cases of nervous coryza and salivation in which disease of the sexual organs was demonstrated by the successful results of treatment to have been the origin by reflex action. He recommends examination into the state of the sexual organs in reflex disorders of the nose.

Reflex Sneezing.—Wertheim and Surmont[648 No.5,'88; 1 Dec.29,'88] writing on the centripetal way of reflex sneezing, reach the following conclusions: 1. Excitation of the olfactory lobes does not provoke sneezing.

2. The ethmoidal ramus of the nasal nerve of the ophthalmic branch, when parting from the nasal fauces, represents habitually the only centripetal way of the reflex of sneezing. 3. Sneezing of ocular origin has its point of departure in the ciliary nerves.

DISEASES OF THE ACCESSORY CAVITIES.

Empyema of the Antrum.—Felix Semon, of London,$^{6}_{\text{Nov.9,16}}$ states that clinical observation demonstrates that empyema of the antrum is, in the very great majority of cases, due to affections of the alveoli of the teeth. He divides the diagnosis into (1) cases in which there is free discharge into the nasal cavity, the pus flowing periodically, *i.e.*, when the head is in a position to enable it to pass, opening into the nose, and (2) cases in which, from some cause, the nasal opening is not patent. In the latter case, distention of either of the walls of the antrum may take place, causing neuralgia, swelling, etc. Semon prefers to reach the cavity through the mouth, though a counter-opening in the nose may become necessary in obstinate cases.



HERYNG'S MOUTH-LAMP FOR THE EXAMINATION OF THE ANTRUM BY TRANSPARENCY.
(*Berliner klin. Wochenschrift.*)

Jelenffy, of Buda-Pesth,$^{4}_{\text{Sept.2}}$ states that he has frequently found the nasal opening of the antrum to be larger than stated by Zuckerkandl, thus rendering it possible to fill that cavity by drawing the fluid up the nose. Jelenffy believes that these large openings induce a predilection to empyema.

Heryng, of Warsaw,$^{4}_{\text{Sept.2,9}}$ has modified Voltolini's mouth-lamp for the examination of the antrum by transparency, so as to make the instrument less expensive. As shown in the cut, it consists of a small Edison lamp mounted on a tongue-depressor. When the antrum contains pus, a condition difficult to recognize under ordinary circumstances, the light of the lamp, when the apparatus is inserted into the mouth, is not detected through the cheek, whereas the contrary is the case when the antrum-cavity is empty. Cozzolino, of Naples, at the late Congress of Otology and Laryngology, claimed the priority of the method, having proposed it at the Brussels Congress one month or so before Voltolini.

Bayer, of Brussels,[136, Jan. 1, 16] calls attention to the fact that he was first to advise depression of the head to evacuate an antral abscess,—a fact generally overlooked by writers. In a case which he describes with great care the hiatus semilunaris was kept closed by polypoid granulations, destruction of these, followed by enlargement of the opening, being found necessary to thoroughly clear the cavity and ultimately cure the case. He notes the frequent presence of polypi with antral disease, and suggests the possibility of etiological relationship. J. H. Bryant, of Washington,[61, Oct. 6] considers inflammation of the antrum characterized by a sero-mucous secretion, *hydrops antri*, as due to nasal disease, and that accompanied by a muco-purulent secretion as the result of extension from the teeth. He recommends peroxide of hydrogen, or glycozone,—a mixture of peroxide of hydrogen and glycerin. Alluding to recurrences of abscesses, Bryant considered them as due to incomplete washing, septic matter being thus left as a starting-point.

William Carr, of New York,[61, Aug. 10] claims that 80 per cent. of all cases of abscess of the antrum are due to disease of the teeth, usually pericemental alveolar abscess, alveolo-pericementitis, and necrosis, his opinion being based upon 14 cases, in which 2 only were found to be the result of nasal affection.

Moritz Schmidt,[841, Mar. 1; 25, Apr.] diagnoses empyema of the antrum by making a small puncture below the inferior turbinated body with a fine cannula, rather thicker and less pointed than a hypodermic needle, and curved like a Eustachian catheter. A pledget, soaked with 20-per-cent. solution of cocaine, is first inserted. He has diagnosed in this manner an empyema in 16 cases, and once a collection of colloid fluid. In 12 cases the exploratory puncture was made with a negative result, but without causing any injury. If pus is found he recommends free drainage through an alveolus. A silver tube is to be kept in.

Friedländer, of Berlin,[4, Sept. 15] publishes a number of cases in which marked success followed, in a comparatively short period, penetration of the antrum from the inferior meatus, thorough syringing with a boric-acid solution, then insufflations of iodoform. A. W. Baker[842, Feb. 16] recommends opening the antrum through the external side of the maxilla above the alveolus, unless special indications for the removal of a tooth exist. He insists on the necessity of a large opening, to render thorough irrigation of the cavity possible.

Syphilis of the Antrum.—Trifiletti[461 Oct.] considers syphilis as one of the so far unrecognized causes of catarrh of the antrum, osseous lesions being the main origin of the purulent exudation. (Report of Massei, corresponding editor, Naples.) Hermet,[24 Feb.17] describes a case of syphilitic perforation of the palate, causing an opening between the antrum and the mouth. The patient until then had been subject to unilateral deafness, attacks of vertigo, rotation toward the right, and loss of consciousness. No mention being made of the presence of pus in the sinus, it is likely that the mental symptoms were due to some other pathological process, and that their arrest at the time of the perforation was but a coincidence.

Tumors of the Antrum.—J. M. Swan, of Canton, China,[235 June] reports a case of cystic tumor of the antrum, removed by external incision. In the posterior part of the cavity was found a fully-developed tooth, presenting the form of a lateral incisor. A case of dentigerous cyst of the antrum is described by Gérard Marchand, of Paris.[7 Feb.] (Report of Gouguenheim, corresponding editor.)

Abscess of the Frontal Sinus.—Ferguson, of Dunedin,[557; 25 Aug.] reports 2 interesting cases of distention. In the first case the right eye was depressed $\frac{3}{4}$ inch (19 millimetres) and projected $\frac{1}{2}$ inch (13 millimetres), a tumor the size of a walnut being present above. Tapping brought out a thick, greenish-brown fluid, and, a free opening being subsequently made, two large holes were discovered in the wall and roof of the orbit. The case did well, but a slight diplopia remained. In the second case the eye projected $\frac{1}{2}$ inch (13 millimetres), and, characteristic symptoms of tumor of the optic nerve being present, exploration of the nerve, after section of the internal rectus, was made, with the result of exposing an opening on the roof of the orbit through which the finger could be passed into the frontal sinus. Half an ounce (15 grammes) of sero-purulent fluid was evacuated, and the eye began to pulsate with the brain. It was therefore concluded that there was an abscess of the frontal sinus, communicating with the cranial cavity. There was subsequent orbital cellulitis, and a free incision through the swollen lid had to be made, which liberated much pus. A vulcanite drainage-tube was kept in. A free discharge of pus through the nasal cavity also occurred a day or two after. The position of the eye greatly improved, and the discharge from the wound almost ceased. The optic neuritis was seen to be subsiding. The author draws attention to two special points of interest in this case: first, the optic neuritis, which he considers due to basic meningitis, and, secondly, the entire absence of any tumor in the orbit to account for the proptosis. In this case, the immense swelling at the time of the second operation rendered Lawson's operation (*i.e.*, draining the sinus into the nasal cavity) impossible, and the subsequent discharge from the nose made it unnecessary. Whether, as the dura mater was exposed by the abscess, it would have been justifiable to open up a communication between it and the nasal cavity through which germs might enter, the author considers as doubtful.

A thesis, on abscess of the frontal sinus and its treatment, by Pitiot,[1216] though containing nothing new, is an excellent review of the subject and very valuable for reference.

Weinlechner,[12, July] reported a case of ectasia of the sinus, and the formation within that cavity of atheromatous masses. The patient had been thrown from a carriage when a child, since which time, according to the patient, the left side of the forehead was more prominent than the right. Headache, giddiness, and loss of consciousness were experienced, with tendency to fall toward the right. Paræsthesia and convulsions also came on. Sillar,[36, June] reports a case of abscess of the frontal sinus in which opening of the same was followed shortly afterward by rigors, then by coma. Upon trephining, an abscess of the left frontal sinus was found and evacuated, but without affording relief to the patient, who died in twenty-four hours. Labit, of Bordeaux,[780, Jan.] reports the case of a man who, after being operated upon for mucous polypi, suffered from purulent catarrh of the frontal sinus, with necrosis of its orifices.

Seiss [9, Jan. 6] presented an interesting paper on the treatment of inflammation of the frontal sinus, which, however, only contains indications for the medication by cocaine, morphia, atropia, etc., of the disease of the nasal mucous membrane, acting as primary cause. A pledget of cotton, soaked in a 5-per-cent. solution of cocaine, insinuated at the mouth of the infundibulum (middle meatus), is recommended as an immediate relief for the headache due to closure of this canal.

Cysts of the Frontal Sinus.—A case of retention cyst of the frontal sinus is described by Karl Grossmann. One year before, the patient, a young man, was struck with a stick near the left eye, and an ordinary ecchymosis resulted. Two months later a swelling began to appear in the upper and inner part of the orbit, and continued to grow, displacing the eyeball. The eye was protruded, being pushed outward, downward, and forward by the swelling, which was most prominent at the upper and inner angle of the orbit, where it was distinctly fluctuating. When the tumor was exposed by dividing the skin over its most prominent part, it was seen to be quite black, and it was feared it was a melanotic sarcoma. An incision into its substance, however, showed that it was a cyst containing about an ounce (31 grammes) of a viscid material somewhat of the appearance of honey, and of the consistence of white of egg, appearing under the microscope as a homogeneous fluid containing a few coarsely-granular corpuscles. The cavity in which it lay was lined by mucous membrane, by which alone it was separated from the roof of the orbit. It seems probable that the blow, which preceded the first appearance of the swelling, caused occlusion of the entrance to the frontal sinus, and the secretion, as it accumulated, had caused absorption of part of the orbital plate, and had thus escaped into the orbit.

Gouguenheim, corresponding editor, reports that Ollier, of Lyons,[211 Mar.3] emptied an ethmoidal cyst in a boy of 16 by performing temporary resection of the nose, obtaining thereby plenty of room for a thorough operation. He was rewarded by finding that prolongation of the cyst extended to both frontal and sphenoidal sinuses, which could then be freely evacuated. The ocular projections and other usual symptoms rapidly disappeared.

Maggots in the Frontal Sinus.—A. L. Fulton[72 Nov.] reported a case in which great pain at the forehead and the presence of a screw-worm in the nasal secretions suggested their presence in the frontal sinus. On opening the latter cavity it was found filled with them, the man dying a few hours later. He had been sleeping near cattle, among which were many cases of screw-worm. Another case was reported by F. W. Kuhn.[72 Nov.] The early recovery of this patient renders doubtful the presence of maggots in the frontal sinus.

Œdema of the Sphenoidal Sinus.—Rolland, of Montreal,[136 July 16] describes an interesting case of dilatation of the sphenoidal sinus from accumulation and retention of liquid. Both nasal fossæ were occluded, while violent headache, loss of memory, and insomnia complicated the case. There was atrophy of the middle and inferior turbinated bodies on the left side, the obstruction of the fossæ being formed by a rounded bony projection. By the use of burrs, trephine, chisel, and other instruments of the same class, permeability of the cavities was re-established. Upon making an opening in the lower part of the tumor, a watery fluid escaped, the patient being taken at the same time with violent nausea and momentary loss of consciousness. Complete removal of the mass thus being shown to be fraught with danger, the operator contented himself with the permeability of the nasal fossæ which he had obtained, and which proved, eventually, sufficient to relieve the patient of all her symptoms.

MISCELLANEOUS.

Statistics.—In an examination of the throats and noses of 2000 children, with a view to determine the frequency of certain abnormal conditions, Chappell, of New York,[5 Feb.] found the following abnormal conditions:—

Adenoid growths,	60
Enlarged tonsils,	270
Deviated septa,	330
Spurs on septa,	150
Hypertrophy of inferior turbinated bodies,	260
Hypertrophy of middle turbinated bodies,	161

This shows that 1231 were suffering from some anatomical abnormality. The author concludes that enlarged tonsils and adenoid growths are the only abnormalities that could be classed as belonging to very early life. The other conditions are acquired, usually, after the age of 6 years, increasing rapidly with each succeeding year until puberty. All social classes were found to be equally liable, and at the same age, while males were more numerous than females in the list of abnormalities.

Antiseptics in Nasal Surgery.—Rice, of New York,[1 Mar.] lays considerable stress upon the importance of antisepsis in nasal surgery. He recommends a 1 to 10,000 solution of bichloride as a wash, applied by means of the post-nasal tube having a sponge attached near its tip to prevent the passage of the fluid into the pharynx. Instruments are to be sterilized by immersion in boiling water. The practice of using antiseptic nasal tampons is unsafe. They are irritating, they prevent drainage, and soon lose their antiseptic qualities. It is better to keep the nostril free, and to keep it as nearly antiseptic as possible by cleansing and antiseptic washes.

Anæsthetics.—Silk, of London,[11 June] anæsthetist to Guy's Hospital, in an essay on the methods of anæsthetization in naso-pharyngeal operations, concludes thus:—

1. That the possibility of using nitrous oxide should always be considered in naso-pharyngeal operations of short duration. 2. Failing this, the advantages and disadvantages of ether, and, by preference, of the combined method, should be carefully weighed before deciding the question. 3. That chloroform, though so frequently used, has, over and above the objections made to it upon general grounds, drawbacks special to these particular operations, and when employed its use should, especially in prolonged operations, be limited to the primary induction of narcosis, substituting ether at as early a stage as possible.

The "head-extended" position is strongly recommended by Stoker,[11 May] while under the influence of an anæsthetic in operations of the naso-pharynx. He considers the interstitial injection of cocaine solution as a dangerous feature, and recommends a fresh 20-per-cent. solution when prolonged anæsthesia is desired. Nitrous oxide is recommended for operations occupying a minute or so, in children particularly. Words of warning against the free use of cocaine solution in the nose were uttered by Lennox Browne, of London,[2 Apr.27] and Tuthill, of New York,[1 Dec.29,'88] lest the cocaine habit be induced. A case of cocaine poisoning was reported by Randall, of Philadelphia,[112 Apr.] caused by the application of, at most, 5 minims (0.31 cubic centimetres) of a 4-per-cent. solution (*i.e.*, $\frac{1}{5}$ grain—13 milligrammes) to the anterior nares. The pledget of cotton used having been pressed before the application, it is not likely that any of the solution had been swallowed.

NEW INSTRUMENTS AND PROCEDURES.

A new lamp based on the principle that a glass rod will transport rays of light to its extremity without radiation of heat was exhibited by Bélin, of Paris,[147 Jan.] before the Academy of Medicine of Paris, at its March meeting. The "cœloscope," as it is called, can thus illuminate the buccal cavity, the pharynx, etc. It consists of a small electric lamp, hidden in a pear-shaped receptacle, and surmounted by glass rods of different dimensions, suited to the different cavities. The operator holds the apparatus, and places it in contact with an electric battery. The amount of light is regulated by a small moderator. Much the same instrument was described by Gaertner, of Vienna.[8, Apr.4]

The difficulty of making satisfactory examination of the naso-pharynx and posterior nares by posterior rhinoscopy is well recognized. Dorn[336, Sept.7; 6, Sept.14] states that he has had great success in cases of operations in this region by placing the patient with the head hanging vertically back over the end of a table. He states that in this position it is easy to introduce a mirror into the naso-pharynx and to see every part of it, and to manipulate instruments, such as forceps and snares, under the guidance of the mirror, just as is done in the case of the larynx. The danger of hæmorrhage during operations is greatly diminished when the patient is in this position.

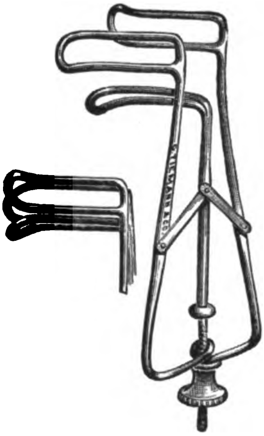
Cozzolino[461, Jan.] introduces a small Edison lamp behind the velum. Inspection through the anterior nasal cavities then becomes practically perfect in appropriate cases. (Report of F. Massei, corresponding editor.)

Vansant, of Philadelphia, describes, in a communication to the editor, an adaptation of a tilting plane-mirror to the surface of the concave head-mirror, whereby the patient may see the reflection of the laryngoscopic picture. This instrument will also be very useful for class demonstration.

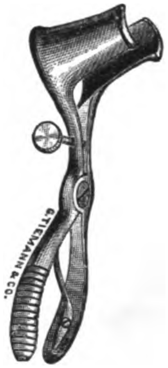
H. L. Spence, of Cleveland, modified Brunton's otoscope for use in the nasal cavities. As in the ordinary pattern, it is necessary to move the instrument after introduction, in order to throw light accurately into the speculum—often to the patient's discomfort, if the parts are irritable. He attached a 3½-inch (9 centimetres) head-mirror to the bell-mouthed light-receiver by a universal joint, thereby obviating this entirely. The remotest parts of the nasal cavity were displayed with brilliancy and clear definition. Several different specula can be used, but the most generally satisfactory is either a modified Zaufal's, with long blades, or the ordinary cylindrical one, with an oval aperture to favor insertion. Without the head-mirror attachment the illumination is not nearly so strong.

The first of the cuts shown herewith conveys a good idea of a self-retaining speculum devised by Potter, of Buffalo.[170, Ap.] Black's speculum[1, Sept. 14] is shown in the second figure. Von Klein, of Dayton,[61, Mar. 9] has devised a speculum the peculiarity of which is its long handles, which enable the patient to hold the instrument for the examiner, at the same time rendering it possible for him to regulate the dilatation of his nostrils in the avoidance of pain.

M. R. Brown, of Chicago,[59, Oct. 5] devised the instrument shown on page 41, which is intended to take the place of the saw, the knife, or the chisel in many intra-nasal operations, particularly on removing ecchondroses and exostoses. The screw at the proximal end, when turned, forces the cutting edges of the two blades slowly toward one another, thus gradually detaching the parts held between them.



POTTER'S SELF-RETAINING NASAL SPECULUM.
(*Buffalo Medical and Surgical Journal.*)

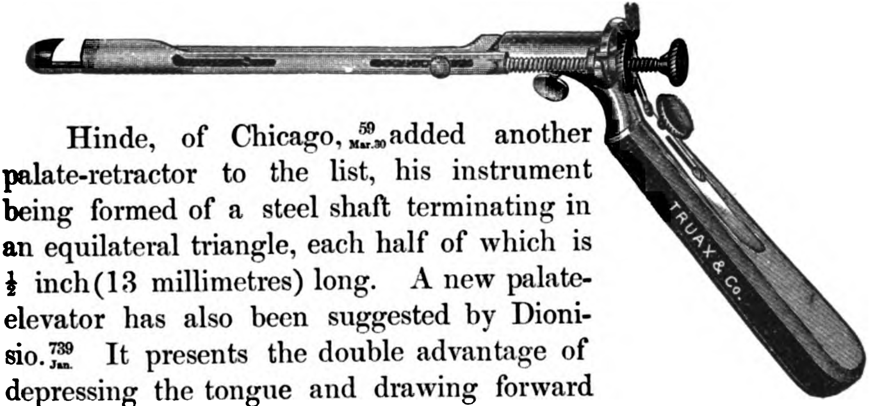


BLACK'S NASAL SPECULUM.
(*New York Medical Journal.*)

A new mechanical saw, in which the to-and-fro motion is obtained by a perpendicular disk revolved by the action of a dental engine or an electric motor, was introduced by Potter, of Buffalo.[170, June] It is simple in construction and can easily be taken apart.

J. M. Blair[1, Dec. 29, '88] introduced a tongue-depressor for children, consisting of a flat, slightly convex blade, the free end of which was narrowed and curved over on itself, forming a blunt hook by which the epiglottis could be pulled forward on to the base of the tongue at the same time that the tongue was depressed. A view of the pharynx and larynx could thus be obtained in obstreperous children. White, of Richmond,[50 Dec.15,'88] devised a self-holding tongue-depressor, which is, doubtless, as effective as it is simple. It consists of an ordinary Turck's, to the handle of which is connected a sliding chin-rest. The tongue is thus held tightly between the two parts of the instrument.

Snares.—Hooper, of Boston,[99 Dec.19] has invented an instrument that will surely be received with great favor,—a combined nasal snare and écraseur, either form of which purpose it can be made to serve in an instant. It also presents the advantage of being strong,—a desideratum when tough, fibrous tissue is encountered. The instrument obviates many of the difficulties often encountered when nasal hypertrophies or polypi are removed. The cut shown on page 42 renders a description unnecessary.



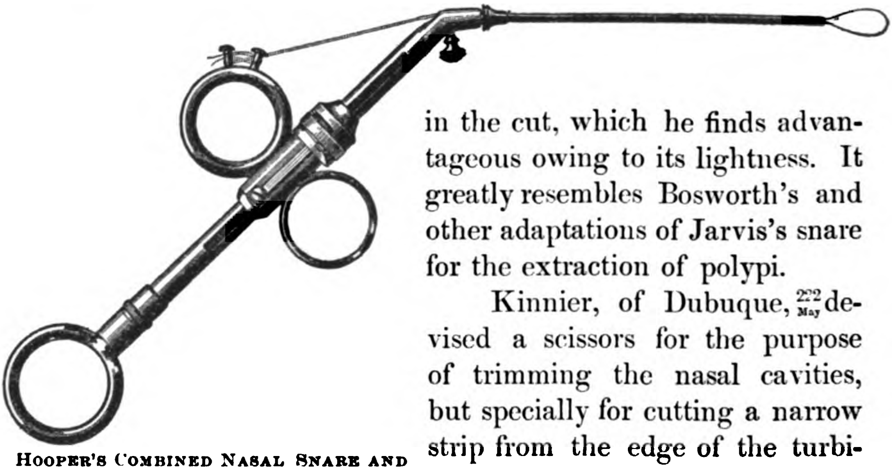
Brown's Ecchondrotome. (*Medical Record.*)

Hinde, of Chicago,[59 Mar.30] added another palate-retractor to the list, his instrument being formed of a steel shaft terminating in an equilateral triangle, each half of which is ½ inch (13 millimetres) long. A new palate-elevator has also been suggested by Dionisio.[739 Jan.] It presents the double advantage of depressing the tongue and drawing forward the velum, and consists of a metallic spatula with handle, to one edge of which is added a metallic rectangle, whose dimensions are proportionate with the pharyngo-buccal isthmus. The spatula and the hook form an obtuse angle. From the superior edge of this rectangle rises the hook, very similar to Voltolini's instrument. (Report of Massei, corresponding editor, Naples.)

Gleitsmann exhibited to the New York Academy of Medicine[1 Apr.24] an electrode designed to facilitate the application of the faradaic current in the nose, naso-pharynx, or larynx. The faradaic current was of peculiar service in allaying a cough due to an irritation of a branch of the trifacial nerve, acting reflexly, and therefore called the trigeminal cough. This writer also exhibited a forceps especially designed for the extraction of pieces of bone from the nose after the soft parts had been cut away. It had great strength of bite, as could be seen by trying it on the finger-nail. It was adapted for entering a very small space and there exerting great force.

Dessar, of New York,[59, Mar.9] introduced a nasal douche-cup. The instrument resembles greatly the ordinary medicine-cup, the mouth end being made smaller to fit the nostril.

G. D. Hall, of Galveston, Texas,[85, May] uses the instrument shown in the cut, which he finds advantageous owing to its lightness. It greatly resembles Bosworth's and other adaptations of Jarvis's snare for the extraction of polypi.



Hooper's Combined Nasal Snare and Ecraseur.
(*Boston Medical and Surgical Journal.*)

Kinnier, of Dubuque,[222, May] devised a scissors for the purpose of trimming the nasal cavities, but specially for cutting a narrow strip from the edge of the turbinated bones, when necessary.

Beverly Robinson [59, Apr.6] adds another instrument to the list of inhalers, devised for the purpose of administering dry vapors. Over all others it presents the advantage of being very small and self-retaining, the cut representing its full size. A sponge inserted in the cylinder and retained in position by a transverse pin, serves to hold the volatile substance employed.

Corradi[461, July] has constructed a new instrument for naso-pharyngeal adenoid vegetations. It consists in a metallic piece, which closely resembles a cricoid cartilage, and is supported by the right index. On the larger surface are thirteen holes. The instrument is attached to the hand by means of a wire. Its object is to press and mortify the morbid tissue. (Report of F. Massei, corresponding editor, Naples.)

DISEASES OF THE PHARYNX, TONSILS, AND SOFT PALATE.

BY D. BRYSON DELAVAN, M.D.
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PHARYNX

Acute Pharyngitis.—In the treatment of inflammation of the isthmus of the fauces, Gouguenheim[37 Sept.] recommends the internal administration of salol. He reports 22 cases rapidly cured by it, 45 to 60 grains (3 to 4 grammes) being given three or four times a day, the drug to be shaken up with mucilage. This treatment was supplemented with gargles and sprays of a solution of boric acid, the diet being confined meanwhile to milk. He concludes (1) that salol acts beneficially in these cases, whatever may be their cause; (2) it quickly subdues the pain and dysphagia which attend them; (3) it shortens the duration of the suppurative form of the disease; (4) it lowers the temperature; (5) in nearly all cases it shortens the duration of the attack; (6) to attain these results the dose should not be less than 4 grammes (1 drachm).

Erysipelas.—Lennander[11 Nov.] gives a description of an epidemic of erysipelas of the pharynx observed in the hospital of Upsala, and follows it with a review of the whole subject of pharyngeal erysipelas, especially in its relation to erysipelas of the skin. In 4 cases observed by him the disease appeared both in the throat and upon the surface of the body. In one of these tracheotomy became necessary. During the epidemic, 4 other patients, all of whom had been exposed to the above, had conditions of the throat similar to those manifested in the form first mentioned, with the exception that there were no external manifestations.

Acute Œdema.—Moure[1 Mar. 16] reports a case of acute œdema of the lower pharynx and larynx in a patient suffering from diabetes, in whom there was no other apparent cause present. He therefore believes that in the so-called acute cases of laryngeal œdema, with the few exceptions where the cause of the trouble is evident, the urine should be examined with a view to finding the actual cause of a lesion otherwise inexplicable.

Retropharyngeal Abscess.—Three cases are reported by Blackader, of Montreal,[279 Mar.] and a number referred to in the discussion of his paper which followed; one is also reported by Cecil.[135 Dec.,'88]

Angina Ludovici.—Schwartz, of Paris,[24 Apr.24] in an excellent article upon this subject, urges, with regard to treatment, that it be energetic and instituted early in the history of the disease. It should be both local and general: general, in the administration of quinine, alcohol, tonics, and highly nourishing food; local, in frequent rinsing of the mouth and throat, to remove the infectious products of the disease, with solutions of permanganate of potassium or, still better, with a 4-per-cent. solution of boric acid. When the submaxillary swelling is not great he recommends interstitial injections of carbolic solutions or of tincture of iodine. When the swelling is considerable, especially when it threatens suffocation, deep incision should be practiced.

TONSILS.

Tonsillitis.—The most important contribution to this subject for the year was furnished by the laryngological section at the last annual meeting of the British Medical Association[2 Sept.14] in a discussion of unusual interest. Haig-Brown called attention to the frequency with which follicular tonsillitis followed exposure to sewer-gas poisoning, and referred to an institution in which the repair of improper drainage had reduced the percentage of tonsillitis to 5 and of rheumatism to 1, as compared with 21 and 4 before the repairs were made. Following the suggestion of Ball, Lasègue, and Lennox Browne, he endeavored to prove a relationship between tonsillitis and acute rheumatism. Of 119 persons observed by him with inflamed tonsils, 28 had rheumatoid pains with the attack, 38 had had former attacks of rheumatism, and 10 were of rheumatic parents, although free from the disease themselves. A close analogy was then drawn between the two diseases, which, while not conclusive, was highly suggestive of their identity. Garrod, Lennox Browne, and others expressed themselves much to the same purpose, and many valuable statistics were presented. Fox referred to tonsillitis accompanying the exanthemata, distinguished between epidemic sore throat and simple tonsillar inflammation, and accepted Cheadle's seven phases of the rheumatic series,—endocarditis, pericarditis, pleurisy, tonsillitis, exudative erythema, chorea, and subcutaneous nodules. By no means the least valuable result of the discussion was the emphasis which it threw upon two facts: first, the advantage of the formal discussion of important questions in open meeting by distinguished observers, and, secondly, the necessity for the re-arrangement of the old views of diseases in their clinical relations in the light of modern bacteriological discovery.

Ruault[286 Ap.] states that he has observed a tendency for intranasal operations to be followed by tonsillitis and acute pharyngitis, particularly when the seat of operation has been the posterior inferior part of the nasal cavity.

Boucsein, of Baltimore,[5 Oc.] in a comprehensive article upon tonsillitis, calls attention to the occurrence of œdema of the adjacent parts in this disease, and reports a fatal case in which death was due to tumefaction of the epiglottis. [I have seen several in which active scarification was necessary, and one lately in which the patient's life was only saved by a timely tracheotomy.]

Phlegmonous Tonsillitis.—In a lecture on phlegmonous tonsillitis, Massei,[589 Mar.] of Naples, corresponding editor, insists on the microbic nature of the disease, and for this reason he recommends sublimate and ice (spray, 1 to 1000; local application with a brush, four times a day, 1 to 500). In the secretion found in the lacunar spaces are found, among many innocent bacilli, the well-known varieties of staphylococcus and even pneumococcus (hence the so-called amygdalitis pneumonia of Cornil and Natier). In confirming the same views, Gabbi,[876] studying the nature of follicular or lacunar tonsillitis, has found, in the follicles which are not yet opened, the capsulated coccus of Fränkel; in the exudation of the follicles which are opened, besides this, the staphylococcus pyogenes aureus and proteus.

Hypertrophy.—Uspenski,[158 R.S.H.I.; 51 Oc.] in order to determine the relations of hypertrophy of the tonsils in childhood to the general physical and psychical development of the children concerned, examined the pupils of two military schools between the ages of 10 and 14, finding among them 52 cases in which hypertrophy existed. Of these, 20 were deficient as to height, weight, and circumference of the chest for their respective ages. A few were myopic; 37

lacked acuteness of hearing; most of them were anæmic, with weak and hoarse voice. Breathing through the nose was difficult and obstructed in most of the cases. With the tonsillar hypertrophy was also granular or atrophic pharyngitis in almost every case, and in many there was swelling of the glands of the cervical and submaxillary region. In 12 cases the uvula was deviated to the right, in 8 to the left; but this had no bearing upon the hearing in these cases. In 18 of the cases the father was dead, in 7 the mother, the cause with the majority having been some form of chest disease. The conclusion drawn was that between tonsillar hypertrophy and physical and psychical development there exist relations which rest, for the most part, if not exclusively, upon heredity.

Charles H. Knight, of New York,[1 Oct. 13] writing upon the galvano-cautery in the treatment of hypertrophied tonsils, reviews the recent literature upon the subject, himself preferring the galvano-caustic loop as compared with the galvano-caustic point or knife. He considers the guillotine far preferable to the cautery in young children, and reserves the latter for older children and adults in whom the ordinary operation is not indicated through risk of hæmorrhage. While, however, one of the strongest arguments in favor of the galvano-caustic method is that it is said to insure against bleeding, a case has been recently reported by Werner in which hæmorrhage came on five days after the operation, and another by Capart, in which, after operation, bleeding was induced by immoderate use of the voice.

Knight admits that burning, if not more painful, is, at least, more disagreeable to the majority than cutting, and that the prevalent dread of hæmorrhage after tonsillotomy is not warranted by clinical experience. He recommends, however, that the galvano-caustic method "be reserved for a comparatively small proportion of cases, including those in which the hæmorrhagic diathesis is present or suspected, those in which vascular anomalies may be recognized or in which anatomical conditions prevent a sufficiently complete excision of the organ, and those in which the use of the knife is positively declined."

Ingals, of Chicago,[139 Nov.] recommends the removal of the tonsils in children with the cold-wire snare, under anæsthesia. For this he has devised a tonsillotomy-forceps so constructed that the blades grasp the tonsil and the wire may be slipped over and engage the base of the gland.

Sir Morell Mackenzie, of London,$^{36}_{\text{Jan.}}$ in speaking of the performance of the operation of tonsillotomy, lays stress upon the importance of using firm pressure against the tonsil in the application of the tonsillotome.

Levis, of Philadelphia,$^{9}_{\text{Dec. 8, '88}}$ succeeded in arresting a severe hæmorrhage following tonsillotomy, by passing an ordinary tenaculum firmly through the tissues at the base of the tonsil, and giving the instrument a decided twist. The torsion effected, the bleeding vessels were thereby compressed, and the position of the tenaculum was maintained by closing the patient's jaws upon the handle of the instrument as it protruded from the mouth. The jaws were then held together by a bandage tied firmly around the head, from vertex to chin. The tenaculum was retained in position for twelve hours.

Harrison Allen, of Philadelphia,$^{9}_{\text{June 22}}$ writing upon the surgical treatment of the tonsils and allied bodies when a cause of pharyngeal irritation, calls attention to the importance of the thorough examination of these organs. Concretions and abscesses should be promptly recognized, as should hypertrophy of the masses of adenoid tissue below the tonsil,—the "infra-tonsillar glands." Treatment directed to these conditions will often succeed in relieving unpleasant pharyngeal symptoms.

Roe, of Rochester,$^{1}_{\text{Oct. 26}}$ describes two forms of chronically diseased tonsils which may exist independently of hypertrophy, namely, chronic disease of the crypts and lacunæ of the tonsils, and, secondly, a fibroid degeneration of the stroma of the organ or a cicatricial formation at its base. After an able presentation of the symptoms and results of these conditions, the author states that the treatment *par excellence* in all cases is ablation with the knife. This is preferable to the galvano-cautery on account of the further increase of cicatricial tissue which the latter favors. [A timely suggestion in view of the present popularity of the latter method.—Ed.]

Hypertrophy with Chest Deformity.—Bilhaut$^{321}_{\text{No. 6}}$ differentiates between rachitic deviations of the chest in subjects of enlarged tonsils and those cases in which the thoracic deformity is essentially due to tonsillar hypertrophy. This second variety, recognized by Lambron, is carefully described by Bilhaut, who advocates for its relief the removal of the tonsils and orthopædic treatment by means of the laced corset applied to the chest. Massage and frictions should be utilized, but he considers it useless to begin any orthopædic treatment, however, until the hypertrophy of the tonsils has been reduced or removed.

Encysted Abscess.—Garel, of Lyons,[37 Jan.] mentions the rarity of chronic encysted abscess of the tonsil following acute suppurating tonsillitis, and reports 3 original cases of the disease. In one of these cases a spontaneous cure had been effected, but the abscess refilled and remained encysted for a month, when it burst spontaneously, leaving the tonsil deeply excavated and granulating. In another case pus had been freely evacuated with a bistoury, and all pain had disappeared. A month after, these re-appeared, the patient expectorated fetid pus, and for twenty-three days the condition remained stationary. The galvano-cautery point was plunged into a cavity which discharged a quantity of pus. This cavity was afterward touched with tincture of iodine and a cure effected. In the third case an abscess had been opened with a bistoury, but pus continued subsequently to be discharged, and a fistula in the anterior pillar, of about a centimetre in length, was found. After three cauterizations the fistula was cured and suppuration ceased. The author strongly recommends the use of the galvano-cautery in these conditions.

Natier, of Bordeaux,[780 Jan.] reports a case in which chronic abscess of the tonsil simulated a fibroma.

Syphilis.—A. A. Lindstroem, of Kiev,[1101 v.1, p.1, 8, '88; 2 Jan. 8] reports 2 cases of hard chancre of the tonsil in M. I. Stükovenkoff's clinic. In 1 case the patient was a soldier aged 24, and in the other a boy of 11. The former contracted a chancre on his right tonsil, most probably from a syphilitic companion, no precautions whatever being in vogue amongst soldiers living in barracks. Still more instructive from this point of view is the boy's history. In June, 1887, his maternal uncle, who was suffering from secondary syphilis with severe throat symptoms, came to live with the boy's family. Early in July his pregnant mother, and about the end of the month the boy himself, contracted tonsillar chancres. In the beginning of August the boy's brother, aged 9, became similarly affected. Toward the end of July the woman was delivered of a healthy child, but about the middle of September the infant began to suffer from coryza and a rash over the body. The mother at the time had moist papulæ about her anus and vagina. Her husband was found, on examination, quite healthy. Lindstroem points out that similar instances of extra-genital syphilitic infection are common all over Russia. In the course of the last four or five years a considerable number of cases of chancre of the tonsil has been published by Carl Szadek (6 cases), Tomashevsky (3), Oscar Petersen (1), Bëloüsoff (10), etc. As the result of an inquiry carried out by the Rïazan Medical Society of 2125 cases of syphilis collected, the infection was contracted in an extra-genital way in as many as 74 per cent.

At a meeting of the New York Dermatological Society, R. W. Taylor[245, Feb.] presented a case of this lesion. In the discussion which followed, Bronson, Bulkley, Allen, Sherwell, Sturgis, and Fox stated that together they had seen 13.

Secondary Lesions of the Tonsils in Pulmonary Tuberculosis.—Dmochowski, of Warsaw,[520, No.15; 28, Aug.] publishes an able paper on the subject, based on his researches in Brodowski's laboratory. In all, 15 fatal cases were examined. They referred to patients of from 18 to 56, suffering from late phthisis; in five of them well-developed laryngeal tuberculosis and multiple (though small-sized) ulcers of the pharynx were simultaneously present; while in one there was found a tubercular ulcer in the nasal cavity, accompanied by fairly numerous tubercles. In every one of the 15 patients more or less intense tuberculous lesions of the tonsils were discovered, while in 10 the follicular glands at the base of the tongue were also affected in the same way.

The principal results arrived at by Dmochowski may be given briefly as follows:—

1. Secondary tubercular lesions of the tonsils occur often, if not constantly, in patients suffering from pulmonary phthisis, as proved by Strassman,[20, p.313,'84] of Cohnheim's laboratory, who has found tonsillary tuberculosis in 13 out of 21 fatal cases of pulmonary phthisis examined. 2. Similar morbid changes in the lymphatic glands at the root of the tongue occur almost as commonly. 3. All facts seem to point out that both the tonsils and lingual follicles are infected from the oral cavity. Indeed, the lesions are met with only in cases of primary tuberculosis of the respiratory tracts. They are

absent when the primary affection is localized in other organs or regions (for instance, in the genital system). 4. The tubercle bacilli, when penetrating from the oral cavity into the crypts of the tonsils and into the hollows of the lingual follicles, give rise to morbid changes, which at first remain superficial but subsequently involve even deeper structures. The initial alterations arise in the epithelial lining, and then in the subepithelial tissue. Soon after the penetration of the microbes into the epithelial cells the latter become opaque, cease to take in dyes, detach themselves from the neighborhood, etc.; in short, the invasion of the bacilli seems to cause something like a complete necrosis of the epithelial elements concerned. The subepithelial layer undergoes inflammatory changes. Later on, the morbid process spreads to the lymphatic sinuses or spaces, and then into the follicles themselves, the changes consisting in an enormous infiltration of tissues with Koch's rods, inflammatory lesions, and the development of typical tubercles. Finally, the latter also appear in the connective tissue between the follicles, along the lymphatic vessels connecting the tonsil with the nearest cervical lymphatic glands (situated close to the large blood-vessels of the neck). 5. Both in the tonsils and lingual follicles tubercular inflammation may lead to ulceration. In the tonsils, however, the ulcers never appear on the free surface of the structure, but are always found in the crypts. [In my experience this is not invariably the case.—Ed.] But in the lingual follicles the ulcers developing in their hollow may easily reach the surface and spread over on a more or less extensive area of the adjacent mucous membrane of the tongue. 6. In the tonsils, caseous disintegration of tubercle may occasionally lead to the formation of cavities. 7. When examined by the naked eye during the patient's life, tubercular tonsils do not present any special or characteristic alterations, and that even when deep-seated lesions are very intense. In the latter case the glands may be slightly enlarged (as in cases of a well-developed faucial catarrh), and, on pressure, yield some turbid mucus or serum. Sometimes they are soft and succulent; sometimes, on the contrary, shrunken, hard, and dry. 8. The striking tendency to the formation of intra-cryptous ulcers may be, probably, explained by the supposition that deeper layers of the glands furnish some more favorable life-conditions for the tubercle microbe than the external mucous lining. [Or, more probably, by the anatomical construction of the lining of the crypt, which becomes more delicate as it approaches the bottom of the cavity.—Ed.]

Tumors.—Cheever, of Boston,[1087] removed a round-cell sarcoma of the tonsil, about 2 inches in diameter, by the following operation: The first incision was semi-lunar, concave upward, marking the boundaries of the digastric triangle. A second incision over the lower jaw at right angles to the middle of the first incision was then made. The mylo-hyoid muscle was now divided and the other tissues pushed to one side. The lower jaw was then sawed in two in front of the masseter muscle. The tumor was pressed out by finger in the mouth, and was found to be covered with a delicate capsule. On puncture a soft material exuded. The tumor and capsule were removed without great difficulty. There was no hæmorrage, and the facial artery and external jugular veins were the only vessels ligatured. The wound in the pharynx was not sutured; the jaw was wired; the external wound in the skin was partially approximated and washed with 2-per-cent. boracic-acid solution and dressed with boracic gauze. The wound was dressed daily. Healing took place rapidly with no unfavorable symptoms. On the thirtieth day the wire was removed and the jaw found to be firmly united.

In the discussion which followed, Agnew, of Philadelphia, expressed the belief that, in view of the certainty of recurrence the operation should be simply palliative. The operation from without was confessedly difficult, and, while in the hands of experts it probably afforded the best opportunity for the removal of all diseased tissue, for the general operator some simpler method—incision through the cheek, for instance—would be better. Vander Veer, of Albany, successfully removed a sarcoma of the tonsil by means of a tonsillotome, the instrument slipping behind the tonsil, which was completely enucleated. The growth did not recur for eight months. Richardson, of Boston, reported a case in which he had operated by external incision, and stated that the patient was living two years afterward.

W. M. Gray, of Washington,[5 Feb.] reports a most interesting case of alveolar sarcoma of the tonsil in a boy aged 6 years. The disease finally involved the tissues surrounding the tonsil, infiltrating the gums and spreading across the soft palate to the opposite tonsil. Duration, about ten months. Death. The paper closes with a *résumé* of 18 cases of sarcoma of the tonsil, from which a brief extract is given of the age and sex of the patient and character of the tumor.

MacCoy, of Philadelphia,[9, Feb. 2] also furnishes an admirable report of a case of sarcoma of the tonsil, in which he was able to study the disease from its earliest appearance to its close. The patient was not operated upon for unavoidable reasons. The medical treatment consisted in the administration of Donovan's solution, increasing the dose until 14 drops were taken three times a day. This was well borne. The local treatment consisted of the galvano-cautery, lactic acid, and finally the application, every few days, of a solution of crystallized iodine and crystallized carbolic acid. This appeared to control or retard the development better than any other remedy used, and effectually destroyed the fœtor during the stages of sloughing. The duration of the case was one year. An excellent review of the literature of the subject closes the paper.

Wolfenden, of London,[11, Oct.] gives a short summary of the subject, and mentions having seen 4 cases of malignant disease of the tonsil during the year, 1 of which was a round-cell sarcoma. The growth was successfully removed with the galvano-cautery snare; there was no hæmorrhage, and two weeks after operation the wound was fairly healed.

Lubet-Barbon[7, Apr. 6] reports a case of epithelioma of the tonsil.

Massei, of Naples, corresponding editor, writes us that in cancer of the tonsil Postempski[802, Dec., '88] operates in the following manner: A cut is made from the upper lip near the commissural angle corresponding to the gland; this is continued downward at first, and then upward in a direction parallel to the inferior maxillary bone, the mucous membrane being left untouched. When the hæmorrhage is stopped, this last is cut and the tonsil excised down to the carotid. Thus, not only the whole gland is taken off, but, in case the carotid is wounded, it is easy to provide for hæmorrhage.

Mycosis.—Seifert, of Würtzburg,[136, Mar. 1] refers to 2 cases of this disease, and reports 1 observed by himself in which the attack appeared to be acute. In the latter case a cure was effected in a few days by the use of ice, to relieve pain in deglutition, and by gargles of borax. Vanderpoel, of New York,[1, Dec. 29, '88] in an able article upon the subject, claims to have had no results from the use of the bichloride of mercury, carbolic and acetic acids, and only partial success from applications of chromic acid. He believes that the cautery knife, repeatedly applied and plunged deeply into the mucous membrane, is the only reliable measure. Goris, of Brussels, reports 3 cases, and states that in his experience the galvano-cautery seemed to give less complete results than removal by means of forceps, followed by repeated applications of strong antiseptics.

Gautier[197 Ja.] recommends, in the treatment of mycosis of the tonsillar crypts, that the mouth of the follicle be incised so that the galvano-cautery may be more thoroughly applied to them or the curette used with better effect.

SOFT PALATE.

In a scholarly article upon "The Innervation of the Muscles of the Soft Palate," Turner[277 Jul.] reports an interesting case, and, having considered the evidence for and against the probability of paralysis of the palate being caused by disease of the portio dura, and, again, by disease of its spinal accessory, concludes (1) that there is not sufficient experimental or clinical evidence to support the doctrine that the muscles of the soft palate are supplied by the portio dura. 2. That experimental evidence shows that these muscles are innervated by the internal branch of the spinal accessory nerve, whose fibres are distributed along with certain branches of the vagus. 3. That sufficient clinical evidence exists to prove that paralysis of the palate results from disease affecting the medullary centre, the roots, and the peripheral distribution of the vagus and its accessory nerve. 4. That with the paralysis of the palate there is associated paralysis of the tongue and of the vocal cords, either unilateral or bilateral, according to the situation of the disease.

Tumors.—Cary, of New York,[59 Apr.13] reports a case of epithelioma of the soft palate.

McLeod, of Calcutta,[6 Apr.13] reports a case of fibro-myxoma of the soft palate and right side of the pharynx, which he successfully removed by external excision and enucleation. In operating, a curved incision was made behind the angle of the jaw and another downward and outward from its convexity. The skin and superficial fascia having been divided, the angle of the jaw was reached and the stylo-maxillary ligament cut. The finger was then carried upward and inward along the deep surface of the internal pterygoid muscle. The tumor was soon reached and found to have passed over the upper border of the superior constrictor of the pharynx. It was easily enucleated, and, the wound having been carefully enlarged, the tumor was drawn through it and the stellate wound stitched, and a drainage-tube inserted in the centre. The cavity thus made was large; the hamular and styloid processes could be easily felt, and the pulsation of the internal carotid perceived by the finger. Little blood was lost, and the mucous membrane of the pharynx and palate was unimpaired. Recovery good, with complete restoration of function.

Syphilis.—Ohmann-Dumesnil, of St. Louis,[287 Nov.] reports a case acquired through smoking an infected pipe, in which two chancres were found upon the velum palati, each about ½ inch in diameter. Diagnosis confirmed externally by an abundant roseola.

McBurney, of New York,[1 Jan.'88] operated successfully upon the hard palate of a syphilitic boy, who had suffered perforation ½ inch wide by 1½ inches long. As the roof of the mouth was unusually vaulted, the operator was able to close the opening by making a long incision to relieve tension along the roots of the teeth on both sides; then freshening the soft parts around the edge of the opening, freeing them from the subjacent bone with an elevator and approximating them with sutures. The wound healed perfectly ten days after the operation, the patient being fed with a tube during the first four days. The voice was perfectly restored.

Poncet, of Lyons,[100 June,'88] reports a case of adeno-chondroma of the velum palati seen in a patient aged 37, who died from suffocation. The growth was of large size and completely filled the lower pharynx.

Dabney[128 Mar.] reports a case of morning sickness cured by amputation of an elongated uvula.

BASE OF TONGUE.

Gleitsmann, of New York,[150 Oct.] reports a case of laryngeal vertigo in a man of 43, suffering from hypertrophy of the glandular tissue at the base of the tongue, cured by applications of the galvano-cautery and of Lugol's solution to the hypertrophied tissue.

DISEASES OF THE LARYNX, TRACHEA, AND ŒSOPHAGUS.

BY J. SOLIS-COHEN, M.D.,

PHILADELPHIA.

DISEASES OF THE LARYNX.

ACUTE LARYNGITIS.

IN an article on the clinical aspects of vocal disabilities in acute catarrhal laryngitis, Moure$^{286}_{\text{v.1,p.837}}$ concludes that the hoarseness is much more due to muscular deficiencies than to physical lesions; that the muscles chiefly involved are the thyro-arytenoids and the arytenoid proper; and that it is especially the paresis of the transverse arytenoid which produces the hoarseness of voice and of cough and the aphonia which are observed in this affection.

Sokolowski$^{520}_{\text{Nov.21,'88}}$; $^{11}_{\text{Apr.}}$ finds that idiopathic phlegmonous laryngitis or submucous laryngitis, in its early stage, frequently presents the same laryngoscopic aspect as laryngeal phthisis, especially in phthisical subjects. In its treatment he recommends purgation, ice, leeches, and vesicatives, with scarifications when œdema is threatening.

B. Fraenkel$^{69}_{\text{July 18}}$ has reported an instance of idiopathic phlegmonous laryngitis with œdematous infiltration in the epiglottis and in the ary-epiglottic folds; with abscesses and phlegmonous infiltration in the arytenoid region; with pus in one crico-arytenoid joint, and exposure of the arytenoid cartilage in spots; and with a fistulous orifice representing the point of rupture of an arytenoidal perichondritis of the other side, the cartilage being largely loosened from its perichondrium. The patient had died of œdema of the larynx, despite opportune tracheotomy.

A case of acute laryngitis in measles has been reported by L. Emmett Holt, of New York,$^{59}_{\text{June 23}}$ in which the vocal bands became completely destroyed by ulceration, which had extended upward to the ventricles and downward for nearly ¼ inch (6 millimetres), penetrating apparently down to the cartilages.

An instance of acute traumatic laryngitis is reported by Lacoarret[780, June] from Moure's clinic. An acrobat, during his contortions and cries, was suddenly seized with acute pain in the throat, with immediate extinction of voice. A few days later the right vocal band was found red and swollen, with a small rupture in the medium portion of its free border, especially distinct during phonation. It was attributed to probable rupture of some of the fibres of the internal thyro-arytenoid muscle. In discussing the subject, Lacoarret states that the lateral crico-arytenoid muscles may likewise suffer rupture under similar conditions of straining the voice, and that then the symptoms do not differ from those observed in paralyses of these muscles. In some cases there is only observed a sanguineous effusion, diffuse or circumscribed. The latter form may become collected into a sanguineous cyst and produce a more or less distinct non-pedunculated tumor. It may even show pulsations and look like nævus. The blood-pressure may sometimes be sufficient to rupture the sac and give rise to laryngorrhagia.

ŒDEMA OF THE LARYNX.

Felix Peltesohn[4, Nov. 4] examined the records of the autopsies made under charge of Virchow, between 1873 to 1878, with the following result: In 3887 examinations œdema of the larynx was noted 210 times,—149 in men, 40 in women, and 21 in children. The majority of the men had been between 18 and 60 years of age and the majority of women between 21 and 54, while 13 of the children had been less than 5 years of age. Forty-four cases had occurred in regional disease and 166 in systemic disease. These diseases are tabulated. Of 5161 patients treated in the clinic for diseases of the throat and nose, between April 1, 1887, and June 1, 1889, there were only 8 with acute œdema of the larynx,—7 in men between 21 and 48 years of age and 1 in a woman 58 years of age. Seven of them occurred in inflammatory regional disease; the etiology could not be determined in the eighth case. Systemic disease could not be recognized in any of the cases.

TUBERCULOSIS OF THE LARYNX.

A. B. Thrasher[58, June 22] advances the opinion that irritation of the larynx, due to mouth-breathing, may be a powerful element in the production of tuberculous laryngitis or even of pulmonary tuberculosis. There has been a history of nasal disease in rather a large proportion of the cases of tuberculous laryngitis in his practice, and hypertrophies of the turbinates have been quite common in its early stages. In the intense dysphagia attending the terminal stages of the disease he has seen the greatest relief from using sprays of vaseline containing 10 per cent. of menthol and from 2 to 5 per cent. each of morphine and cocaine.

In an excellent article on some unusual manifestations of tuberculosis of the larynx by Clarence C. Rice, of New York,[1 Aug] and illustrated by cuts of unusual merit, attention is invited, among other things, to the frequency of the active co-existence of tuberculous and syphilitic laryngitis, and to its clinical significance. A case in point is related in the person of a man 35 years of age, who had suffered with throat symptoms for six months. Rice was struck with the extensive destruction of the epiglottis as compared with the intra-laryngeal degeneration. The arytenoids presented the typical semi-œdematous swelling, and there was slight ulceration on both sides of the larnyx, but the larynx as a whole presented a much healthier appearance than would have been expected if the ulceration of the epiglottis had been occasioned by tuberculous infiltration and ulceration.

We might here mention that tuberculous ulceration of the epiglottis would very probably have been associated with great thickening.

Antisyphilitic treatment cured the ulcerations, but did not reduce the arytenoid tumefaction. The patient died within about six months from tuberculosis of the lungs with typical tuberculous ulceration confined to the cavity of the larynx.

At the International Congress of Otology and Laryngology, A. Gouguenheim, of Paris,[37 Sept] read an article on papilloma and tuberculosis of the larynx. Instances of papilloma and tuberculosis of the larynx were cited, from his own practice, by the editor of this department in the first edition of his treatise on diseases of the throat in 1872, and Gouguenheim cites him as recognizing their etiological relations in a re-issue of the second edition in 1880; but only of recent years has the relationship been fairly acknowledged by the profession. Gouguenheim cites an instance observed by himself on the autopsy of a hemiplegic subject in 1878. After referring to a number of examples described by several authors, and discussing the general relations of the subject, the memoir closes with the following conclusions:—

Tuberculous laryngitis may assume the form of non-ulcerous, circumscribed tumors. This variety may be primitive or consecutive. The tumors may be indubitably tuberculous in structure, or they may be formed of typical papilloma. Inoculation with the papilloma of tuberculous laryngitis may produce tuberculosis either by intermediation of the bacilli of Koch, which they may contain in small quantity, or by intermediation of the mucus covering their surface. The papilloma of tuberculosis may be multiple, large, and confluent, or it may be small and not confluent. Recurrence is a constant characteristic. The disease may exist a long time and the pulmonary indication be tardive. The treatment is prolonged. Cure is usually very difficult, but it is possible. Anatomico-pathological researches are still necessary to determine the relations between the papilloma and the tuberculosis.

Tuberculous tumors of the larynx are discussed by A. Cartaz,[152 Mar.12,14] who summarizes what has been published, and contributes a number of instances from his own practice.

Henry Handford[2 Jan.27] briefly relates an instance of laryngeal tuberculosis, with temporary bilateral abductor paralysis. Kidd[6 Jan.26] reports a peculiar obstructive form of laryngeal tuberculosis which simulated bilateral abductor paralysis.

L. Grünwald, of Munich,[34 No.13] reports two instances of tuberculous abscess rupturing through the track of the tracheotomy wound.

Treatment.—Treatment of topical tuberculosis of the larynx by lactic acid continues to grow in favor, and a great number of articles have appeared on the theme. Of these, we will refer only to that of Krause, who, after four years' experience with this treatment, regards it only more favorably than when he first instituted it. In the Congress for Internal Medicine held April, 1889, Krause[116 May] read a paper at considerable length. He highly indorses Heryng's treatment by curetting, which he had practiced in 71 cases with 41 complete cures. Sixteen of the patients remained cured without recurrence; 15 suffered from recurrence; 7 died from causes other than the laryngeal tuberculosis; 12 were still under treatment, and the remainder had been lost sight of.

Prolapse of the Ventricle of the Larynx in Tuberculosis.—Gouguenheim, of Paris,[37 Sept.] reports 5 cases seen by him during as many years. One only was in a male subject, the youngest, and aged 37 years. The others occurred in females, two of whom were 40, one 48, and one about 55 years of age. In every instance the lesion was unilateral and right-sided. In but one could tuberculosis be excluded; three were certainly tuberculous, and one presumably tuberculous. One case was cured under the influence of the electric cautery. One was cured by replacement of the sac.

Surprising success in the treatment of chronic tuberculous infiltration by electrolysis has been reported in five instances by Heryng, of Warsaw.[3 Sept.25] In one case there was complete resolution of the tuberculous infiltrations of the epiglottic folds. In a second case of epiglottis with ulceration, which had resisted lactic acid and curetting, two applications sufficed for the disappearance of the infiltration without pain and without inflammatory reaction, and cicatrization became effective in three weeks. The patient having died of dysentery, an autopsy was made, and the microscopic preparations had shown that the parts treated with electrolysis had been completely cured, a layer of squamous epithelium covering the surface previously ulcerated. I have seen complete destruction of limited tuberculous infiltrations and ulcerations under electrolysis with cicatrization.

External Operations in Tuberculosis of the Larynx.—Betz, of Mainz,[116 Nov.] discusses the indications for surgical interference in tuberculosis of the larynx, and especially with reference to laryngectomy. He refers to the opinion expressed by E. Fränkel and by Massei, that this radical procedure should be practiced in cases of primary tuberculosis, and he cites an instance reported by Hopmann in 1887, in which the patient's sufferings were wonderfully relieved to the date of death, some three months later, as a result of the progression in the pulmonary lesions.

He then reports a case in which he regrets that he did not practice timely extirpation, as the progress of the case and the post-mortem examination rendered it probable that such a course would have been preferable to the tracheotomy and symptomatic treatment which had been pursued. While Betz is far from believing that such cases as the one in question are frequently observed, the fact that they do occur does not, in his opinion, justify absolute abstention from laryngectomy in their treatment.

LUPUS OF THE LARYNX.

Whipham and Delépine$^{2}_{\text{Mar. 16}}$ record an instance of tubercular lupus of the larynx, trachea, and bronchi, producing stenosis of the trachea and bronchi, in a boy 14 years of age, whose father had died of consumption. One tonsil and posterios palatine fold, the septum of the nose, and the inferior turbinated bones were ulcerated. Death took place by dyspnœa the day after a tracheotomy had been performed. In the discussion which followed the report of the case in the Clinical Society of London, the opinion was expressed that the disease was an example of co-existent syphilis and tuberculosis, rather than of lupus.

LEPROSY OF THE LARYNX.

A case of leprosy, under the care of Frederick Taylor and the late Wooldridge at Guy's Hospital,$^{2}_{\text{July 27}}$ is reported, in which tracheotomy was performed on account of laryngeal obstruction, and which occurred in the person of a boy, the son of healthy European parents, who took him to India as an infant. He was 20 years of age, and had been leprous for some fourteen years. The general leprous manifestations were very extensive. When admitted to the hospital, November 21, 1886, the patient's voice was a husky whisper, but up to two days previously it had always been normal. The epiglottis showed some loss of substance, with growth on the anterior surface. The ary-epiglottic folds were thickened. The vocal bands were somewhat thickened. July 30, 1888, the larynx was seen to be ulcerated and deformed, and the epiglottis was wrinkled up and swollen. July 31, the patient woke at 2 A.M. with some difficulty in breathing. Dyspnœa increased, and tracheotomy was performed the next evening, with relief. He died quietly from other complications on the seventeenth day after the operation. The larynx was covered with small ulcers; the vocal bands were clogged and almost fixed by secretions, though they were not ulcerated. The epiglottis was short, thickened, rolled transversely, and ulcerated.

MORBID GROWTHS OF THE LARYNX.

Among the more unusual examples of morbid growths of the larynx reported since our last issue, we mention the following: An angeioma of the size of a hazel-nut on the inferior portion of the left vocal band, reported by Ferrari.[376 Dec.,'88] It was crushed with the forceps. Alarming hæmorrhage occurred during the night, and was controlled with some difficulty by applications of ferric chloride. Tracheotomy was performed. A violent hæmorrhage occurred just as the operation was completed. It was successfully restrained by use of tampons. Nevertheless, death took place by infectious pneumonitis within forty-eight hours.

Two instances of lipoma have been reported by P. McBride, of Edinburgh.[36 Feb.] One was as large as a pigeon's egg, and was attached to the epiglottis; and the other was as large as a bantam chicken's egg, and was attached over the left arytenoid cartilage. Both, therefore, conformed to the usual rule, that lipomas are developed on the exterior of the larynx, and not in its interior.

Two instances of recurrent growths in extreme contrast have been reported. W. F. Quaife[267 June] reports a fibroid tumor of the larynx with four recurrences in rapid succession, and ultimately conquered with chromic acid. R. P. Lincoln, of New York,[233 June 1] reports recurrent papilloma in a patient on whom the late Dr. Elsberg had performed thyrotomy twenty-two years previously for the removal of a recurrent growth, which he had failed to eradicate during two years of intra-laryngeal treatment.

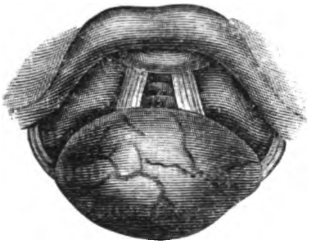
Desvernine[773 Sept.5] reports an instance of nine multiple congenital papillomata in a scrofulous lad 7 years of age. Seven distinct growths were detected laryngoscopically. Tracheotomy was performed. These growths were removed at intervals with forceps. During the procedures an eighth growth was detected below the glottis, to reach which laryngotomy was performed. It occupied the right upper edge of the cricoid cartilage. A few months later a ninth growth was discovered attached by pedicle to the right vocal band close to the arytenoid cartilage. This was extirpated endolaryngeally. Three months later the larynx showed no trace of lesion, and the tracheotomy tube was removed. Respiration and voice had continued normal.

Goris, of Brussels,[52 Apr.27] reports a case of subglottic fibromyxoma in a young lady 24 years of age, from whose larynx it was extirpated endolaryngeally.

A case of fibroma of at least thirteen years' standing, and which, during that time, had been frequently subjected to intralaryngeal treatment, was exhibited by Michelson to the Verein für wissenschaftliche Heilkunde, of Königsberg.[4, Sept.] It projected from the right ventricle into the anterior two-thirds of the glottis. The greatest part of it was removed with crushing forceps, relieving the dyspnœa and diminishing the irritation exciting cough.

In a leading article by Moure[828, v.1, No.3] are recorded 3 unusual cases of morbid growths,—a mucous polyp obstructing the whole infundibulum of the larynx removed piecemeal with forceps, a papilloma filling the entire larynx of a pregnant woman and removed spontaneously by cough, and a case of bilateral mucous polyps inserted along the entire length of the vocal bands so as to simulate œdema of these structures.

Cartilaginous tumors have been discussed by Ferrucio Putelli,[781, v.7, p.561] who cites 20 cases reported, 8 of them enchondromas, and records an enchondroma of the cricoid cartilage from his own observation, discovered post mortem, in association with œdema of the larynx in the body of a man, 50 years of age, whose dyspnœa had been attributed to a heart disease, for which he was under treatment.



Cyst of Arytenoid Region.
(*Revue de Laryngologie, d'Otologie, et de Rhinologie.*)

Ricardo Botey, of Barcelona,[186, June 1] reports a telangiectasic fibromyxoma, 33 millimetres ($1\frac{3}{10}$ inches) long and 27 millimetres (1 inch) wide, which he removed, with forceps, from the larynx of a man 45 years of age.

An instance of cyst of the arytenoid region has been reported by Furundarena-Labat, of Tolosa.[136, Apr.15] This is an exceptional region for such growths, which are usually found in the epiglottis or in the vocal bands. The growth occurred in a man 30 years of age. It was the size of a small nut (see cut), smooth in outline, soft, transparent, and marked on the surface with a vascular reticulum. It occupied the posterior half of the vestibule of the larynx, concealing the cartilages of Wrisberg, the arytenoids, the supra-arytenoids, and the posterior two-thirds of the vocal bands. It was incised, and its contents were discharged by compressing the tumor with forceps. A clear liquid escaped, mixed with concrete, yellowish, granulo-lardaceous masses. Its point of implantation was upon the right arytenoid cartilage. The operation was completed by tearing away the fragments of the sac and applying some cauterizations with chromic acid.

Diagnosis.—The difficulty of diagnosis sometimes encountered, even when extirpated fragments have been subjected to examinations under the microscope, is exemplified in a case of Beschorner's,[812 May] in which microscopic examinations of fragments removed from a lady 70 years of age revealed papilloma at first and carcinoma some time later. Tracheotomy was performed, and otherwise the treatment was symptomatic only, there being no change in the aspect of the larynx during a period of five years. Death ensued by marasmus and cardiac paralysis.

Semon's celebrated inquiry into the transformation of benignant growths into malignancy[1234] has been completed and has also been republished as a monograph. It shows most conclusively that the supposed transformation does not take place. Thus, such transformations have been reported in but 45 cases out of 10,747; spontaneous in 12 instances, and after intra-laryngeal operations in 33. These 33 cases occurred out of a total of 8216 cases submitted to operation, or 1 in 249. Only 5 of them, however, are deemed to be undoubted or nearly undoubted instances of transformation,—a proportion of 1 in 1645. Seven of them are allowed to be probable instances, and if these be included the proportion would be 1 to 685. If the cases deemed doubtful be added to the list, the entire number would be 22 to 8216, or but 1 to 373.

Furthermore, comparing the instances given of spontaneous degeneration and of degeneration after intra-laryngeal operation, Semon points out that the former occurred in 12 instances out of 2531, or 1 to 211, while the latter occurred in 33 out of 8216, or 1 to 249; so that, actually, spontaneous degeneration is rather more frequent in untouched cases than is post-operative degeneration in those interfered with. Consequently, he is forced to the conclusion that intra-laryngeal operations can exert no influence which will transform a benign growth into a malignant one.

There are many other concurrent lessons to be learned from this valuable contribution to laryngology which should be in the library of every one engaged in this pursuit.

Treatment.—Our corresponding editor, Massei, of Naples,[11 Feb] in an illustrated article discusses the use of the curette in removing morbid products from the larynx. He concludes that the process is not properly appreciated. He considers it very serviceable in cases of growths in the subglottic region and on the vocal bands or on their free edges. He claims that it removes portions of tissue from which the growths have originated, and permits better direct access with lactic acid or other topical agents applied to prevent recurrences. A new curette has been devised by Gottfried Scheff.[8 Mar.28] By means of a spiral stem it can be readily rotated on its axis. It was successfully used to eradicate a growth at the inferior surfaces of the anterior vocal commissure, and thus avoided an otherwise necessary thyrotomy.

Carcinoma of Larynx.—Auto-inoculation of one vocal band by impinging upon carcinoma of the opposite band has been reported by Newman.[6 Jan.19]

A. Gouguenheim, of Paris,[1 Mar.9] reports an interesting case of carcinoma of the larynx, in which, some time after tracheotomy, he was compelled to devise a special cannula much larger than the ordinary one, the upper part of which was rigid and the lower two-thirds flexible. The flexible portion was composed of a continuous spiral of metal, the rings of which were attached to each other. Fig. 1 shows the inner cannula, while Fig. 2 represents the patient wearing the cannula.

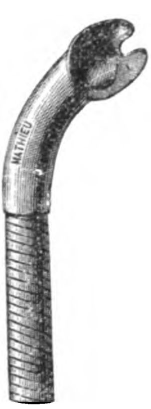


FIG. 1—INNER TUBE.
(*New York Medical Journal.*)

Laryngectomy for Carcinoma.—E. Boccomini[616 Oct.12,19; 2 Nov.23] reports a case in a man 54 years of age. He became hoarse August, 1887. In March, 1888, Labus diagnosed epithelial carcinoma of the right vocal and ventricular bands. Tracheotomy became imperative on September 27th. Complete extirpation was practiced October 25th. The œsophageal feeding-tube was removed on the seventh day, and liquids could be swallowed sufficiently well to dispense with artificial feeding. On the eighteenth day solid substances, like fried brain, chicken, and bread, could be swallowed. On the twenty-seventh day the wound was healed except as to a tiny fistula under the hyoid bone. The patient remained in perfect health for several months, taking ordinary diet and attending to the tube himself. About the middle of February, 1889, recurrence began in the neck: dysphagia ensued, and death took place by exhaustion on April 19th, five months and twenty-four days after the operation.

Extirpation of the Larynx.—George R. Fowler, of Brooklyn, 5 Oct. has described a case in which he extirpated an epitheliomatous

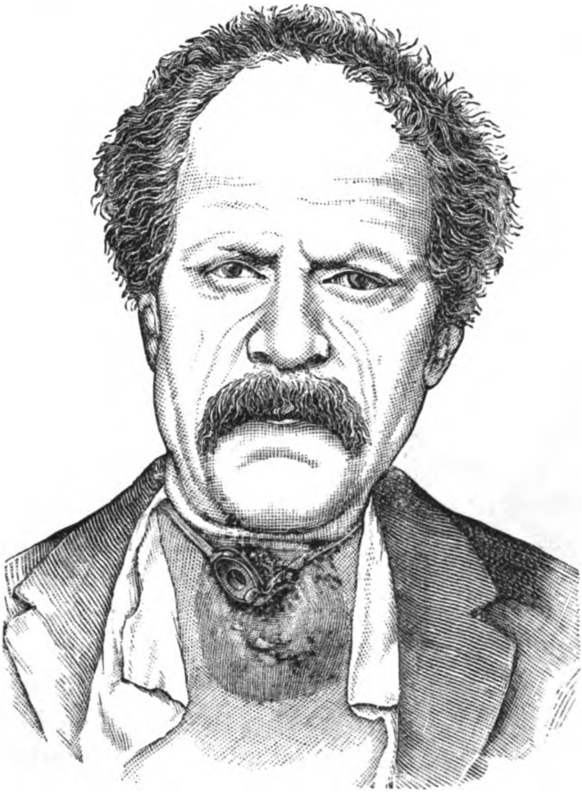
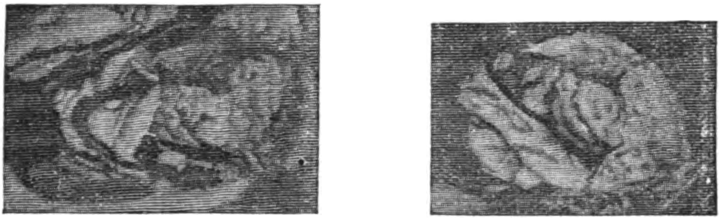


Fig. 2.—Gouguenheim's Case of Carcinoma with Flexible Cannula.
(*New York Medical Journal.*)

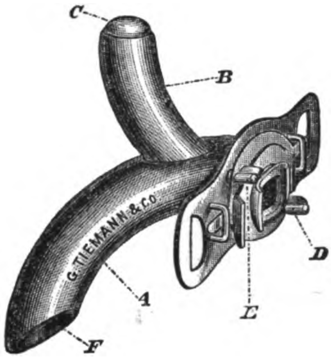
larynx from a lady, 58 years of age, by the modified laryngectomy suggested by myself, which consists in leaving the wings of



During Respiration. **During Phonation.**
(*American Journal of the Medical Sciences.*)

the thyroid cartilages in position. At the time of operation the growth occupied chiefly the left side of the larynx, involving the vocal band, and encroached slightly upon the right side. The appearances during respiration and during phonation are shown on page 11, after photographs by T. R. French.

The operation was performed under anæsthesia by nitrous oxide, which had been maintained without difficulty for one hour and forty minutes through the orifice of a preliminary tracheotomy performed a few days previously. The patient arose from the operating-table, fully conscious, within a minute after completion of the dressings, and without the slightest symptom of shock. For the details of the operation, which differed in one or two points from the procedure originally suggested, we must refer the reader to Fowler's paper. Feeding was accomplished by means of an œsophageal tube.



FOWLER'S MODIFICATION OF GUSSENBAUER'S ARTIFICIAL LARYNX.

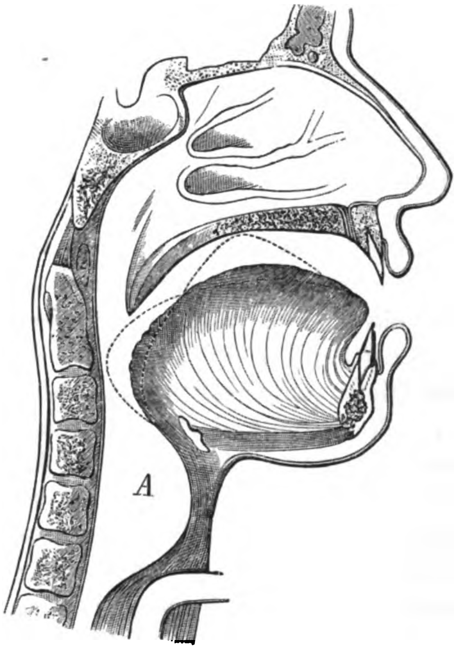
A, tracheal cannula; *B*, pharyngeal or chimney tube; *C*, obturator used during meals; *D*, button for securing ring attached by a wire to obturator; *E*, button for securely holding the chimney tube; *F*, beveled extremity of cannula.

(*American Journal of the Medical Sciences.*)

On the forty-first day a modified Gussenbauer's artificial larynx was placed in position. It consisted (see cut) of an aluminium apparatus without the usual cumbersome projecting ring-collar, which was replaced by the flat plate and retaining-button of the ordinary tracheotomy cannula. Forty-four days after the operation the patient partook of a hearty meal, principally solid food, and on the seventy-third day she was discharged cured, cicatrization being complete. She was able to speak in a loud whisper without the aid of artificial voice-reeds. Seven months later, at the time of reporting the case, there was no evidence of recurrence, and the patient was perfectly comfortable and in good health.

Normal Compensatory Voice after Extirpation of the Larynx.—A few instances have been recorded of voice production by the vicarious action of the cicatricial tissues without the interposition of an artificial appliance after extirpation of the larynx. The most interesting example has been described by Strübing, of Griefswald.$^{69}_{\text{Dec.27,'88}}$ A patient of Schmid's had undergone entire extirpation of his larynx, and the upper tracheal opening had healed over so that there was no communication between the trachea and the pharynx. Nevertheless, the patient was able to speak distinctly enough in a rough, loud voice to fulfill the requirements of his business.

The mechanism of this production of voice was studied with the aid of Landois, and was found to be as follows: The removal of the entire larynx had left underneath the base of the tongue a considerable space (see cut) which could be contracted and dilated by muscular effort. This chamber acted as a supplementary bellows in place of the lungs to produce the stream of air necessary for the production of voice. Then, by forcing the base of his tongue against the posterior wall of the pharynx, the patient produced a temporary stenosis, leaving a narrow slit between the two structures. When the chamber described was contracted by muscular effort, the air it contained was driven between the lips or reeds formed by the corrugated pharynx and the base of the tongue, and produced a vibratory rubbing effect, which could be utilized for articulation in place of the normal vocal tones produced by the vocal bands. The vicarious reeds were formed principally by the stylo-glossi muscles and the musculature of the adjoining walls of the pharynx. The compression of the air was accomplished by the action of the same muscles in association with that of the stylo-hyoids and of the kerato- and chondro- pharyngeal muscles.



Diagrammatic Representation of Pseudo-voice after Laryngectomy.

(*Deutsche Medicinische Wochenschrift.*)

When the base of the tongue was pressed forward with a tongue-depressor, the pseudo-voice could not be produced. The voice was a monotone. The air in the chamber was insufficient to provide for more than a few words in succession. The sac readily refilled with air on relaxing the muscular effort necessary to empty it. In the production of the sounds *k*, *r*, and the German *ch*, the voice failed because the tongue could not be brought near the posterior wall of the pharynx, and these sounds were produced by intense musculature action between the tongue and the palate.

In a case of total extirpation performed by Charles Symonds$^{2}_{\text{May 2}}$ on a patient of Greville Macdonald, a low, distinct, gruff voice was found practicable by passing a curved tube through the upper wall of the cannula to the base of the epiglottis, which had been severed in its lower third. The vibrating structure appeared to be the mucous membrane of the pharynx running back from the epiglottis. It is to be hoped that these cases and that of Stoerk's, reported last year, will lead surgeons to endeavor so to dissect the structures removed in laryngectomies as to provide for the fortuitous or the designed formation of an adventitious glottis whenever practicable, and thus try to avoid the necessity for employing metallic reeds to the cannula to supply an artificial substitute for the voice. This would be progress, indeed, in laryngo-chirurgy.

Billroth's Statistics.—Fritz Salzer$^{226}_{\text{B.39,H.2}}$ reports 11 unpublished operations performed by Billroth between January 1, 1885, and June 30, 1889, and then presents a table of 34 operations performed between March 21, 1870, and May 19, 1889, with various comments and reflections which can hardly be suitably presented in abstract in the limited space at our command. The operations for carcinoma were as follow: There were 5 total extirpations. Of these, 1 patient with recurrence died seven months after operation, 1 died five weeks after operation from a wound in the œsophagus, and 3 died within the first week after operation. For nine years past Billroth has no longer practiced total extirpation, having found that some sound portion of the larynx can be retained in every instance. There were 6 complicated resections. None of the patients died in consequence of the operation, but recurrence ensued in every instance. Two patients died five weeks after operation, 1 three months and 1 four months after operation; while 2 were living eight months and two months, respectively, after operation, but with recurrence in both instances. There were 8 simple partial resections. Of these, 2 patients died one and six days after operation, respectively; 1 died in seven weeks with pleuritis; 1 died in eighteen months with topical recurrence; 1 died four years after operation, apparently from granular metastases; 1 is living one year after operation, but with recurrence; and 2 are living without recurrence three and one-half years and one year, respectively, after operation. There were laryngo-fissures. Of these, 3 patients died within the first ten days; in 2 topical recurrence ensued within a month, rendering further operation necessary; in 1 case the carcinoma could not be extirpated and total extirpation was practiced later; 1 patient died two and one-half years after operation, with recurrence; 1 left the hospital well, but had not been heard from since; 1 is living without recurrence eight years after operation; and 1 is without recurrence two months after operation.

The 5 operations for other diseases were as follow: One laryngo-fissure for tuberculosis of the larynx diagnosed after operation. The patient died in eight days of tuberculosis of the lungs and of the ileum. One laryngo-fissure for cicatricial stenosis after a laryngotomy practiced some six years previously. The wound healed by suppuration; cicatricial stenosis recurred; unilateral extirpation was practiced; the patient recovered with permanently impaired glutition, that function having been perfect before the extirpation. One laryngo-fissure for rhinoscleroma: recurrence. One laryngo-fissure for extensive papillomata: recurrence, and endolaryngeal operation: whispering voice

Several of these cases are made the subject of special comment; the selection of cases for operation and the choice of procedure are discussed. The method of operation and after-treatment recommended as the outcome of Billroth's experience is summed up as follows: Narcosis, with a mixture of chloroform, alcohol, and ether. High tracheotomy. Insertion of Trendelenburg's tampon. Laryngotomy. Splitting the larynx in the middle line from below upward with probe-pointed bistoury or with bone scissors. Excision of the diseased tissues, or resection of portions of the larynx by freeing the structure from below upward. Accurate arrest of hæmorrhage by ligature and compression. Accurate tamponing of the wound with iodoformed gauze, kept in position from five to ten days. Simple, unfenestrated tracheal cannula. Antiseptic dressing. Artificial feeding by the œsophageal tube when demanded by necessity. Removal of the cannula as soon as practicable after removal of the tampon of iodoformed gauze.

LARYNGEAL PARALYSES.

A unique instance of rapid extension of posterior paralysis to complete paralysis of the recurrent has been reported by Martius$^{4}_{\text{Apr.20}}$ to the Berlin Laryngological Association. A boy 13 years of age had had diphtheria. During reconvalescence fever became suddenly re-established on the twelfth day of the disease, with hoarseness and slight tendency to regurgitation, fluids returning through the nose. The vocal bands were reddened, and the left band showed slight impeded movement without definite indications of paralysis. On the sixteenth day, at 10.30 A.M., this band was found immobile in the median position, with no trace of abduction in respiration, and a slight motion toward the right side in intonation. A few hours later, the band was found immobile in the cadaveric position. At 4 P.M. death occurred unexpectedly, under continuously increasing cardiac failure. The abduction revealed perineuritis and neuritis of the left pneumogastric, parenchymatous myocarditis, endocarditis, thrombosis of the sinus, and pachymeningitis. The right pneumogastric was altogether normal, while the left one was infiltrated with pus for 2 to 3 centimetres (⅘ to 1 inch) at the level of the larynx, the perineurium as well as the nerve itself. There were no changes in the cranial portion of the nerve, although the pachymeningitis was considerable. The development of the paralysis took place under the eye, in accordance with the explanations of Rosenbach and Semon.

The difficulty sometimes found in detecting morbid growths from aneurisms as the cause of a laryngeal paralysis is well exemplified in the 2 cases following:—

Martius$^{4}_{\text{Apr.20}}$ reported to the Berlin Laryngological Association an instance of left-sided recurrent paralysis in a laboring man 48 years of age, the physical symptoms attending which indicated aneurism of the arch of the aorta, even to a pulsating tumor and apparent lack of synchronism in the radial pulsations. Death occurred suddenly a few days later. Carcinoma of the œsophagus was found, with extension over the larynx. There was no trace of the pneumogastric to be detected in the purulent cancerous mass, but beyond this point the nerve was infiltrated with copious, thick, turbid fluid.

In the discussion, Lubinski spoke of a case of paralysis of the left vocal band in cadaveric position, with cardiac palpitation and sudden paroxysms of dyspnœa and of difficult deglutition. The physical signs pointed to aneurism of the aorta, being dullness to the right of the heart, projection of heart some little distance beyond the middle line, and a loud systolic murmur over the sternum. Bloody expectoration began a few days later, and the patient died soon after. A carcinomatous tumor was found which had involved the arch of the aorta and the recurrent nerve.

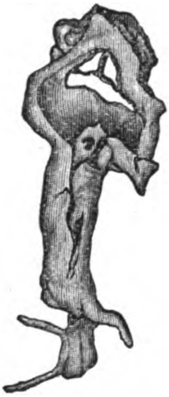
STRICTURE OF THE LARYNX.

An instance of complete cicatricial occlusion of the larynx is reported from Schrötter's *klinik* by Georg Juffinger.[8 Oct. 31] Hoarseness without known cause had existed two years and a half in a man 25 years of age. This was followed by dyspnœa, eventually requiring tracheotomy. Six weeks after the operation all communication was shut off between air-passages and pharynx. Attempts at dilatation failed. Division of the larynx and removal of the obstructing tissues was only temporarily serviceable. Schrötter found complete occlusion of the larynx. The arytenoid cartilages were closely adherent, and the ventricular bands were thickened and in contact. After repeated failures to find a passage either by way of the mouth or by way of the trachea, Schrötter passed a harpoon-lance between the ventricular bands and through the cicatricial tissue into the trachea. A thin thread was then thrown around this instrument in the tracheal wound and drawn up through the mouth, when its two extremities were tied together. The next day a thicker thread was tied to the tracheal end of the first one and drawn through in its turn. Subsequently larger threads, then catgut, and eventually a leaden wire of considerable size were drawn through. This was followed by the graduated dilating prisms, until on the fortieth day Schrötter's No. 20 could be introduced. At this time a small granulation tumor was detected in the glottis and was removed with the electro-caustic snare. Dilatation was continued as before, and eventually confided to the patient, who became enabled to work and to sleep with his cannula closed. It was hoped that eventually the cannula could be removed.

In a paper on the production of constrictions of the trachea in tracheotomized children, Wilhelm Fleiner[20 Apr.] shows that it is frequently due to incurvation of the edges of the divided tracheal cartilages, when the incision has been made to one side of the middle line, or when the cannula used has been proportionably too large for the incision.

FOREIGN BODIES IN THE AIR-PASSAGES.

H. R. Wharton, of Philadelphia,[9 Apr. 13] has related an instance in which a large-headed brass shawl-pin, some 2 inches in length, detained for ten days in the trachea of a child 4 years of age, had produced extensive fibrinous pseudo-membranes. Tracheotomy being performed, the trachea bled profusely, and shreds of false membrane were ejected in such quantities as almost to lead to the suspicion that the dyspnœa had been due to croup rather than to the presence of a foreign body; and it was deemed imprudent to continue the search for the foreign body until the patient should have thoroughly reacted from the debility produced by the loss of blood. Seven hours later blood began to be ejected through the tube in large quantity, and great dyspnœa was manifested. The tube was removed and the incision dilated, when a large fibrinous cast (see cut) was discovered just below the lower border of the tracheal wound, where it had probably occluded the lower orifice of the cannula. Shortly afterward the point of the pin was seen lying close to the posterior wall of the trachea and was removed with forceps. Small particles of fibrinous matter were expelled for a few days, after which recovery gradually ensued.



Fibrinous Cast of Larynx and Trachea in a Case of a Foreign Body.
(*Medical News.*)

THYROTOMY, OR LARYNGO-FISSURE.

Karl Becker, of Marktzeuln,[34 Apr. 30] discusses the results in 120 cases: 57 for papilloma and fibroma, 19 for carcinoma, 3 for sarcoma, 11 for foreign body, and 30 for various stenoses. Of 7 patients who died after the operation, 1 succumbed in collapse the day after an operation for carcinoma. Of the other 6, 1 died from diphtheria of the wound, 1 from croup of the bronchia, and 3 from pulmonary œdema due to the flow of blood into the lungs. In 1 of these 3 the trachea had not been tamponed, and in the other 2 the occlusion was incomplete. The remaining 113 persons recovered thoroughly from the operation. The final result of the operation depends upon the cause which has rendered it necessary. After extraction of foreign bodies the functions of the larynx become fully re-established. If stricture supervene, dilatations become necessary. In strictures the result depends upon their character. Radical relief is not always attainable, and in such cases patients may have to wear a cannula permanently. In tuberculosis relief is always given, even when death is merely postponed. A tuberculous patient in whom Hopmann performed laryngo-fissure and cauterized the ulcerations was still fulfilling his duties as a preacher eleven years afterward. In tumors good results will depend upon thoroughness of removal of the morbid tissues.

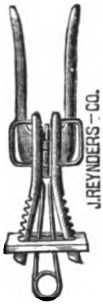
TRACHEOTOMY.

The literature of tracheotomy has been increased by numbers of observations and memoirs of the usual character, and has been enriched by a few records and observations of unusual or of novel character. Of the latter we mention an instance, reported by A. Ernest Mayland, of Glasgow,[96 Mar.] of tracheotomy in a case of cervico-dorsal spinal abscess producing pressure upon the trachea and œsophagus, in which death occurred from ulceration of the tube through the trachea into the innominate artery. The abscess was located opposite the lower two cervical and upper two dorsal vertebræ, and had pressed the trachea and œsophagus against the upper portion of the sternum.

Edward A. Wright, of Huddersfield,[96 Apr.] reports an instance of tracheotomy for dyspnœa from mediastinal abscess in which no relief followed the operation because the obstruction was too deeply situated. An India-rubber catheter was pushed down the trachea as far as the bifurcation and ruptured the abscess, which discharged about an egg-cupful of offensive pus. The patient made an uninterrupted recovery.

Edgar Holden, of New Jersey,[59 Feb.16] has devised a new form of dilating tracheotome or divulsor, the use of which he thinks would possibly take the place of tracheotomy and intubation in some cases, particularly where interference must be immediate. It consists, first, of a curved pair of smooth blades about 1 inch (2.54 centimetres) in length and $\frac{1}{6}$ to $\frac{1}{8}$ inch (4.23 to 3.17 millimetres) in width, fringed at the base with flaring lower ends and lever-like projections; second, of a handle with curved, trocar-like point, in which the blades fit for introduction. (See next page.)

The perforation is made through the crico-thyroid space, the hinged blades (divulsor) are detached, the trocar is withdrawn, and the closed blades are slipped upward between the vocal bands and separated and held apart by a perforated bar, which drops or can be pressed downward for the purpose. The operation can be almost instantaneous, almost bloodless, and the instrument withdrawn and replaced at will. The opening into the air-passages is but 2 lines in width, and is closed by the divulsor. The parts remaining outside permit a view of the edges of the wound.



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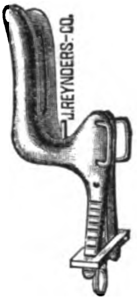
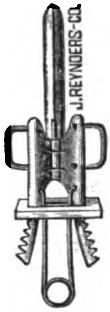


SIDE-VIEW.



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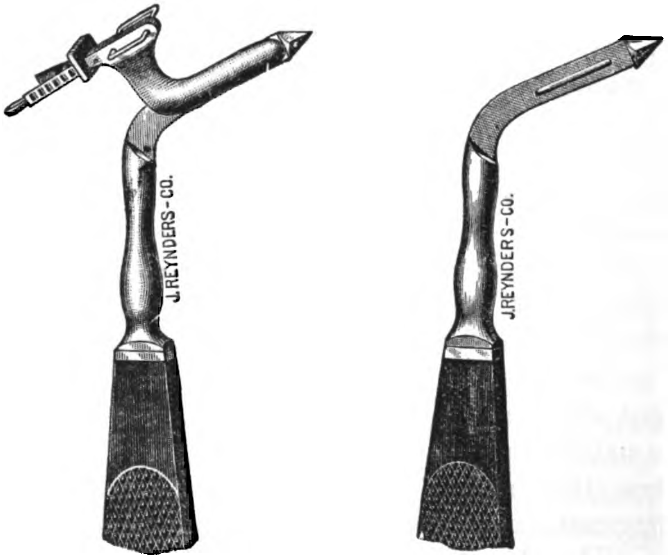


HOLDEN'S TRACHEAL DIVULSION SET.
(*Medical Record.*)

Holden remarks that the device is perhaps not applicable to infants in whom the crico-thyroid space has not developed so as to be readily felt by the finger.

Joseph Collier, of London,$^{6}_{\text{Dec.22,'88}}$ has devised a scissor-handled, curved, tracheal dilator, the convex portion of which is grooved like a grooved director. The incision having been made into the trachea, this director is slid through the wound along the back of the knife. The knife is then withdrawn and the dilator is expanded, affording the greatest facility in the introduction of the cannula.

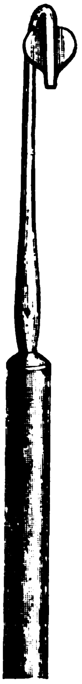


Fig. 1.

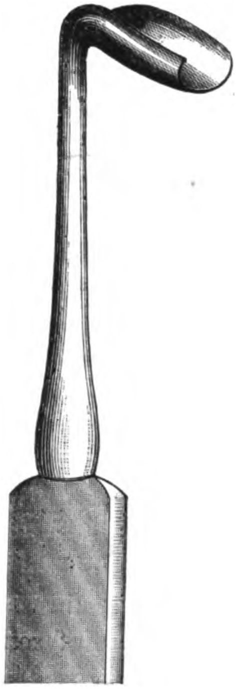


Fig. 2.

As improvements in performing the operation, Hildebrandt, of Hettstaedt,$^{69}_{\text{Mar.28}}$ presents two new instruments, the use of which in tracheotomy serves to avoid hæmorrhage, both in reaching the trachea and incising it. His method of operating is as follows: After cleansing the field of operation and disinfecting it with iodoformed ether, a fold of skin is raised between two sharp pincettes and an incision 4 centimetres ($1\frac{1}{5}$ inches) in length is made between them, through the skin and adipose tissue down to the superficial layer of fascia. This fascia is then divided longitudinally, and the knife and pincettes are placed aside. The assistant then takes two retractors and the operator two hooks of the form shown in Fig. 1. These have the great advantage that the connective tissue can be readily separated with the points, and then be still farther separated to a distance corresponding to the broad portion of the hook. The assistant then places his retractors in the slit thus made, and, while he holds the sides of the fascia apart, the operator enlarges the slit by working his hooks upward and downward. When the median edges of the two sterno-hyoid muscles are exposed, the operator inserts his hooks between them and separates the connecting fascia upward and downward. The assistant immediately shifts his retractors to the newly-made passage and draws the two muscles apart, placing the retractors between the veins. The lower border of the thyroid gland is now usually seen in the upper corner of the wound, and not infrequently the upper lobe of the thymus gland is seen below and sometimes the innominate vein. The thyroid gland is pulled upward by the assistant. The thymus gland and the vein are protected from injury by inserting a peculiar-shaped guard (Fig. 2), which is so formed as to embrace the anterior wall of the trachea more or less accurately. The pretracheal fascia is now divided with the hooks in the same manner as the previous fascia, and the trachea lies exposed. The knife is now resumed, and three rings of the trachea are divided. While the knife is still in the trachea it is turned on its axis so that the tracheal wound gapes. The assistant and operator then each pass a retractor into the trachea and separate the edges of the wound while the knife is being withdrawn. The trachea is now cleansed of mucus, blood, and membrane, and a few drops of the iodoformed ether is instilled into it. After insertion of the cannula the lateral edges of the wound are washed with the ether and a few stitches are inserted.

In this method there is no bleeding of sufficient importance to complicate the operation, which has seldom required more than seven minutes for its execution.

Tracheotomy Tubes.—In a previous issue we called attention to Sajous's objections to aluminium as a material for the cannula. We have again to cite similar strictures by St. Szcz. v. Zaleski[57 May] on the basis of some experiments in animals. Zaleski introduced some portions of aluminium into the air-passages of cats, and found that there was an appreciable loss of substance. Aluminium was found soluble in saliva, mucus, bile, lymph, and various decomposing tissues, demonstrating the unsuitableness of the metal for the construction of tracheotomy tubes. Observations are made, too, on the action of the secretions on the silver tubes, but this is too well known to our readers to require reproduction. On the whole, Zaleski concludes that the most desirable material would be silver thickly gilded. Ruel, of Genf,[71 July] has sought to overcome the difficulties sometimes found in disembarrassing patients of their cannula by gradually inuring the patient to the use of a short external cannula, barely reaching as far as the trachea, and provided with a concentric, shutter-like diaphragm by which the external orifice can be diminished at will or be entirely cut off.

Occlusion of Tracheal Fistulæ.—Berger$^{14}_{\text{No.13}}$ has succeeded by the following procedure: He circumscribes the fistulous orifice by two semi-elliptic incisions, 15 or 20 millimetres ($\frac{3}{5}$ to $\frac{4}{5}$ inch) from the opening. This collarette is then dissected from circumference to centre, and well liberated as far as the edge of the orifice, into which it is invaginated, cutaneous surface downward, the raw surface being united with sutures. Then the inferior and superior angles of the incision are prolonged, and the skin is liberated laterally and the edges brought in contact in the middle line.

ŒSOPHAGUS.

Œsophagoscopy.—Hacker$^{8}_{\text{No.23}}$ reports some interesting personal experiences in Billroth's clinic. In a man, 31 years of age, who for five months had symptoms of œsophageal stricture, its cause was discovered by means of a straight tube and Leiter's pan-electroscope, and several excrescences around the ulcerated circumference of the stricture were removed with forceps for microscopic examination. In strictures from cauterization it is not easy to practice œsophagoscopy. In one instance the upper portion of the stricture could be seen very well. It looked like the mouth of a uterus; but the normal plication of the œsophageal mucous membrane was absent, and the changes of lumen by the respiratory acts was much less than normal. The interior of the stricture could be seen clothed with uneven, white cicatricial masses, and a sound could be passed through it under guidance of vision. In carcinoma very distinct views were often obtained of its two chief seats,—the region of the tracheal bifurcation and that above the cardia,—as well as of the occluding infiltrated places in the mucous membrane and the exulcerated portions and the excrescences. In 3 cases particles had been removed with forceps for microscopic examination. In 2 cases of carcinoma incarcerated pieces of meat had been detected and extracted with forceps. In 2 cases foreign bodies had been detected in the normal œsophagus: in one instance a denture, which was removed through the tube with forceps; in the other, a large mass of meat, which had glided into the stomach by peristalsis on being touched with the forceps.

In 2 cases of dysphagia without stricture, and attended with detention of food and regurgitation, the mucous membrane of the cervical portion of the œsophagus appeared as though longitudinally scorched in one instance, and in the other several fissures were seen in the lower portion. This suggested that spasmodic contracture of the œsophagus might take place in fissure analogous to the contractions which take place in fissure of the anus. A case in point was narrated in which carcinoma of the cardia had been diagnosed in a man who had been in the habit of chewing and swallowing chicken-bones; and post-mortem examination revealed changes due to injuries thus produced, but no carcinoma.

Abnormal Conformation of the Œsophagus.—An excellent and well-illustrated article on vices of conformation in the œsophagus, comprising a valuable summary of the literature and two original observations, has been contributed by M. J. Brosset.$^{211}_{\text{May 28; June}}$ It may be regarded as the most valuable essay extant on these anomalies.

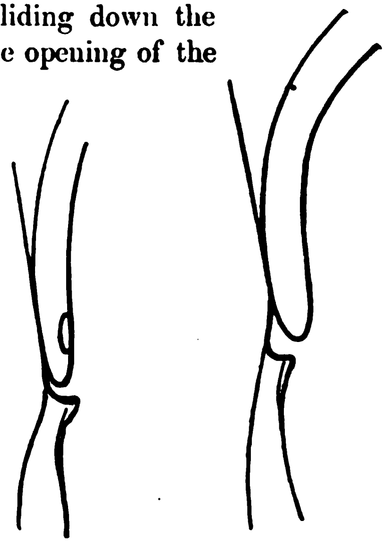
DILATATION OF THE ŒSOPHAGUS.

A unique instance of dilatation of the œsophagus below a constriction in a case of carcinoma has been reported by Ewald.$^{4}_{\text{June 3}}$ There was an annular carcinomatous ulcer in the middle of the œsophagus 14 centimetres ($5\frac{1}{2}$ inches) below the superior orifice. Beneath it was a spindle-shaped dilatation 12 centimetres ($4\frac{7}{10}$ inches) in diameter. The muco-muscular tissue was in great measure destroyed, minute shreds and patches only of the mucous membrane remaining on the surface of the muscular layer, which was greatly atrophied, in some places to the thickness of a sheet of paper. This condition was attributed to retention of aliment above the cardia in consequence of inability of the organ to propel the food into the stomach.

DIVERTICULUM OF THE ŒSOPHAGUS.

A diverticulum 14 centimetres ($5\frac{1}{2}$ inches) in length at the top of the œsophagus was found at the autopsy of an insane man, who had died suddenly, without appreciable cause, after a subhyoid pharyngotomy practiced for the removal of an impacted foreign body. As the sac was not lined with mucous membrane, E. Hoffmann,$^{60}_{\text{May 9}}$in whose practice the case occurred, suggests that it may have originated in an abscess which discharged into the œsophagus instead of into the mediastinum, and that it became enlarged by the detention of masses of aliment as in other diverticula.

Berkhan reports $^{4}_{\text{Mar.18}}$ a case of cure of a large diverticulum of the œsophagus by a very ingenious plan of so introducing bougies as to promote the obliteration of the pouch. A man 52 years of age came under his care in March, 1876, whose symptoms had begun unaccountably in January, 1874. When the patient took a drink, a sac the size of a walnut became formed on the left side of the jugulum, and when the water overflowed its rim and passed down the œsophagus a gurgling was distinctly heard without the use of a stethoscope. When the filled sac was pressed upon, the liquid was forced into the mouth. Finding that straight elastic sounds always met with an obstruction in gliding down the posterior wall and readily entered the opening of the diverticulum (Fig. 1), Berkhan took a conical, blunt-end bougie, 47 centimetres (18½ inches) long, dipped its lower half into hot water, and bent it into a catheter form, which it retained, on cooling, without losing its elasticity, so that he was able to pass it in front of the diverticulum (Fig. 2). It was introduced daily. In four weeks' time the patient could swallow liquid aliment much better. From April 3d to July 31st the bougie was used 71 times, by which period the patient became able to swallow any kind of nutriment and regained his health and strength. Up to the beginning of 1888, eleven years after treatment, the patient was not able to swallow dry bread quite so well as other articles of food, and occasionally on turning his head experienced a sensation as though the left side, where the agglutinated sac lay, was somewhat thicker than the right side. The only trouble he experienced was that he could not drink swallows of water so rapidly after one another as most people can do. When he drank a glass of water a slight gurgle could still be heard without the stethoscope.



1 2

FIG. 1.—BOUGIE ENTERING THE DIVERTICULUM.
FIG. 2.—PASSING IN FRONT OF THE DIVERTICULUM.
(*Berliner Klinische Wochenschrift.*)

RUPTURE OF THE ŒSOPHAGUS.

Henry F. Formad, of Philadelphia,[112, Oct.] adds to the literature of this subject the autopsy of 2 cases which, in close succession, came under his observation as coroner's physician.

FOREIGN BODIES IN THE ŒSOPHAGUS.

Among vagaries of foreign bodies in the œsophagus may be cited an interesting case reported by E. Maziere Courtenay, of Limerick,[166, Jan.] in which a woman, with hypochondrial insanity, stated that she had, with suicidal intent, swallowed a chestnut, which had stuck in her throat and rendered her unable to swallow. Her story was not believed, although on probing it was found impossible to pass anything into the œsophagus except a No. 12 male catheter. Swallowing gradually improved and continued good for an entire year, although, when allusion was made to the subject, complaint was made that the chestnut was still there. Then swallowing became difficult again; acute phthisis set in, from which death ensued in two months. On the autopsy the trachea was removed, and then a hard substance was felt lying behind the œsophagus. This substance proved to be the chestnut in a perfect state of preservation, unaffected by any form of decay or of chemical decomposition, and appearing as though only just swallowed. It had evidently ulcerated through the œsophagus at the junction of the pharynx. It was lying on the fifth and sixth cervical vertebræ, where it had made a pocket for itself. The vertebræ were denuded of periosteum, and their surfaces were rough and corroded.

Instances of death from penetration of the left common carotid artery have been reported by Ivanoff, of Kostroma.[1162; 11, Oct.]

A case of death by apnœa from serous effusion five days after œsophagotomy, by Pye, for the removal of an artificial denture, seems to have been due to injury to the pneumogastric nerve during the operation; the reporter, C. F. Warren,[2, Mar.], having noted that the pulse varied greatly during the operation, at one minute being below 40 and at another above 90, and that the slowed pulse of irritation of the vagus was observed several times during the course of the case.

An instance in which a long false passage in the mediastinum made by a foreign body was mistaken for the œsophagus, both before œsophagotomy and during the operation, has been reported from the service of Lagrange.[188 Aug.11]

Von Hacker[8 Oct.31] reports a case from Schrötter's clinic, in which he was enabled, with the panelectroscope, to see a large, irregular fragment of hog-bone impacted in the œsophagus of a woman, 23 centimetres from the incisor teeth or just above the region of the tracheal bifurcation. The tube slid past the body, having probably pushed a circular fold of the mucous membrane before it. The bone was extracted with some difficulty owing to its impaction, the forceps having slipped from it twice. On the third attempt the two ends of the bone were detached by appropriate screwing motions, and then the bone was readily removed with the tube. There was no blood lost in the manipulation, although previous attempts, a few hours earlier, to remove the body with the coin-catcher had produced considerable hæmorrhage.

There is no doubt that the use of this œsophagoscope is of great value in avoiding injury to the walls of the œsophagus in the extraction of irregular foreign bodies, inasmuch as the position of the body can be detected and the manipulation be controlled under inspection.

The value of the potato treatment has been further exemplified in instances related by Overlach, of Frankfort-on-the-Main.[41 Feb.18]

ŒSOPHAGOTOMY FOR FOREIGN BODIES.

Georg Fisher[301 B.25,p.505; B.27,p.273; B.29,p.107] has collected 120 cases in which this operation was performed. The mortality was 26.8 per cent.,—87 recoveries and 32 deaths in 109 cases. Two deaths of the last 12 were not due to the operation, Richet's patient having died of tuberculosis nine weeks after the operation, and Fischer's from pulmonary gangrene unconnected with the operation.

Two days after the removal of a piece of glass by Frew,[96 V.7,p.187,'89] by an œsophagotomy, in which it had been necessary to divide and ligature the superior and inferior thyroid arteries, great expectoration of blood ensued. The sutures were severed, but no bleeding vessels were found. Although the bleeding ceased spontaneously, the inferior thyroid artery was again tied with silk and the wound reunited. There was severe hæmorrhage from the wound the next day. The wound was again opened under narcosis. The bleeding was so profuse that it was only after great difficulty that the bleeding vessel was finally discovered. It was tied with silk. The wound was left open. The patient was very weak. Transfusion of chloride of sodium was made into the radial vein and the patient recovered. This is the first time that a wound has been re-opened after œsophagotomy to find the source of hæmorrhage. Its success justifies the recommendation of it by Fisher in his second article.

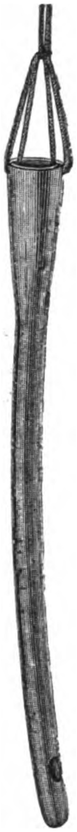


FIG. 1.—SYMONDS'S TUBE FOR INTUBATION OF THE STRICTURED ŒSOPHAGUS.

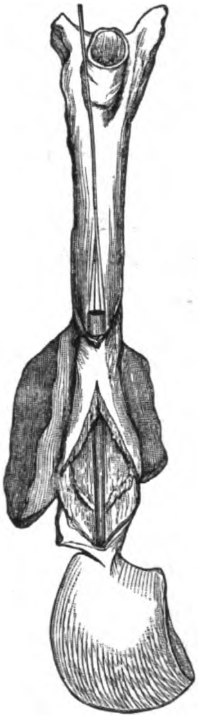


FIG. 2.—TUBE IN POSITION AS SHOWN ON A POST-MORTEM EXAMINATION.

(*London Lancet.*)

STRICTURE OF THE ŒSOPHAGUS.

One of the most valuable and perspicuous clinical lectures it has ever been our pleasure to read was delivered by Piéchaud$^{70}_{\text{Dec.16,'88}}$ upon a case of stricture of the œsophagus in a child, 5 years of age, who had swallowed some solution of potassium. We cannot refer our readers to a more vivid delineation of the production, course, termination, and morbid anatomy of cicatricial stricture from such an accident.

Charters J. Symonds, of London,[6] Mar.30,Apr.6 discusses some further improvements in his method of treating malignant stricture of the œsophagus, which is of such great value that we record it here somewhat in full, although we must refer the specially interested reader to the original article for much that has been omitted. This treatment is practically by the permanent retention within the strictured portion of the œsophagus of a tube, 4 to 6 inches (10 to 15 centimetres) long, made of gum-elastic on a silk web. The upper end is expanded into a funnel, which is to rest upon the upper portion of the stricture. The lower end is rounded and close, and ¼ inch (6 millimetres) from the end it has an eye of large size, through which the liquid aliment swallowed by the patient escapes below the stricture. A piece of plaited silk is passed through about ⅜ inch (9 millimetres) below the rim of the funnel in a single thread, and the portion inside of the tube is drawn out and tied to the side pieces about 2 inches (5 centimetres) above the funnel (Fig. 1). This method of securing the thread never leads to blocking of the tube.

Fig. 2 shows one of these tubes in position as it was found in the œsophagus after death in a patient who had been wearing it for some time. The tube is introduced by means of a rod of whalebone, over which is drawn a gum-elastic sheath. The whalebone fitted with this sheath (Fig. 3) is passed down to the end of the tube and the sheath fitted into the funnel. On inserting, pressure is made by the sheath, the whalebone keeping the tube rigid. By this means a tube with an open end can be used, and

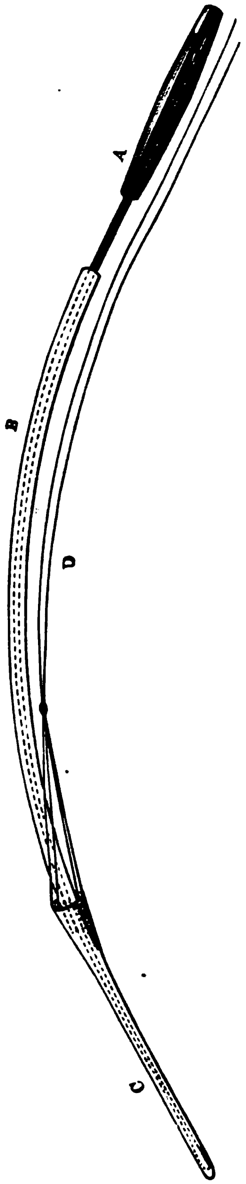


FIG. 3.—MODE OF INTRODUCTION OF SYMONDS'S TUBE.

A, handle of whalebone conductor; B, gum-elastic sheath; C, the intubation tube; D, the threads.

(*London Lancet.*)

the danger be avoided of pushing the whalebone through the end of the tube. Symonds usually employs the bare whalebone stem, as it presents less bulk in the patient's throat.

The exact position of the stricture having been ascertained by means of a large bougie, the longest conical bougie possible is passed in order to judge of the size of the tube to be used. Fitting now the introducer, the operator will mark on it the distance to the stricture, or make a knot in the silk, and insert with the head of the patient thrown well back. When it has entered the stricture, he will send the tube down slowly till arrested by the funnel, and then withdraw the introducer. The silk being held taut, the tube is kept in contact with the introducer. The silk is now tied round the ear and fixed behind by a piece of strapping. Symonds has found that strictures dilate under this treatment, so there may be some danger of passing the funnel of a small tube clear through; but he adds that this will not occur, as a rule, with a No. 14 English scale, which is about as large a size as it is wise or necessary to use in malignant disease.

The longest time Symonds has left a tube in position without removal has been two months, and when it was removed it was still pervious and useful.

Symonds reports briefly 12 cases in point, which, with 5 previously reported, make 17 who have died under observation. Of 5 other cases similarly treated, 2 were submitted to treatment for a short time only and 3 were still under treatment. Of the fatal cases 9 died with the tube in position, swallowing to the last; 4 had become able to swallow without a tube for some time before death; in 1 a long rubber tube was substituted and worn in comfort for four months and a half; in 1 other a long rubber tube was used for three weeks after eleven months' use of the short tube; in 2 the long tube of Krishaber was used after cough on deglutition had ensued and given rise to much distress from ulcerations of the mucous membrane over the cricoid cartilage. The majority wore the short tube up to the time of death, or became able to swallow in consequence of the dilatation effected. The longest periods of life after this treatment was commenced were eleven, eight, seven, and six months.

The patients died from the unimpeded and unhastened progress of the disease.

Senator, of Berlin,$^{2}_{\text{June 22}}$ dilates with a laminaria tent, a string from which runs through the entire length of a bougie, to which it is attached in order to provide for its safe withdrawal. It is left in position for from half an hour to an hour, according to the amount of swelling it undergoes by imbibition. It must not be left on too long nor be applied too frequently. The cases most favorable for its use are cicatricial strictures.

Linear Electrolysis in Stricture of the Œsophagus.—J. A. Fort$^{100}_{\text{Mar. 19, June 25}}$ recommends in three successive articles the employment of linear electrolysis directly over the stricture with a current of from 10 to 30 milliampères, and in a number of short sittings. It should be combined with dilatation. While the treatment is particularly adapted to strictures of cicatricial origin, it is also of great service in carcinoma.

In calling our attention to these efforts of Fort, our esteemed corresponding editor, Gouguenheim, mentions that he has tried this electrolytic treatment in one case of carcinoma, but that he prefers the use of flexible sounds of caoutchouc through which a conductor is passed through the stricture by means of a whalebone conductor, and to allow it to remain in position for the introduction of aliments.

Coarctation Stricture of the Œsophagus, with Fistule.—Jul. Heddæus, of Idar,$^{4}_{\text{Sept. 9, 16}}$ relates an interesting case of an agate-grinder, who had consulted him from time to time since 1869 for various affections incident to his vocation. These included costal periostitis from pressure against his bench, with abscesses over the ribs and over the clavicles, pleuritis, and ulcerative pneumonitis. After having suffered with cough for a long time, he was almost suddenly seized in May, 1888, with dysphagia, with painless retentions of solid food in the œsophagus. The sputa were occasionally hæmorrhagic, and the cough so severe that it often led to emesis with discharge of entire contents of the stomach. A sound 13 millimetres ($\frac{1}{2}$ inch) in diameter encountered a readily permeable obstruction of a few centimetres length just above the bifurcation of the trachea.

The difficulty increased, notwithstanding occasional improvements from the use of sounds. Laryngo-stenotic breathing came on, and the larynx no longer moved downward in inspiration. The sputa became colored like prune-juice, and finally fluids swallowed escaped by the larynx; so the patient recognized that a fistulous communication must have been made between the food-passage and the air-passage. When a catheter reached the point of stricture air audibly passed through it on rapid expiratory movement or on coughing. The patient died November 6th.

At the autopsy the bronchial glands were found to be diseased and purulent in front of and behind the œsophagus, and a fistule large enough to admit the end of a little finger was found between the œsophagus and trachea, both passages otherwise showing nothing pathological.

Pollosson[304, Mar.26] reports a case of localized carcinoma, without producing constriction and without extension of the disease, which was found in a patient whose œsophagus had been compressed by an enlarged lobe of the thyroid body. Tracheotomy had been performed to relieve respiration. Subsequently œsophagotomy was performed under the opinion that the œsophagus was occluded by morbid growth, but when the œsophagus was opened it was found that its walls were in coarctation in consequence of the pressure from the enlarged lobe of the thyroid gland. When this lobe was removed there was no difficulty in passing an œsophageal sound of large calibre.

Our valued corresponding editor, F. Eklund, of Stockholm, Sweden,[372, v.24, p.400] calls attention to the cure of a case of stricture from swallowing corrosive fluid in an infant 2 years of age. Œsophagotomy was performed, and the stricture was then incised with a Maisonneuve urethrotome, and was subsequently dilated with bougies.

CARCINOMA OF THE ŒSOPHAGUS.

We call attention to a clinical lecture on epithelioma by P. Lancereaux,[17, Mar.12] at the Hôpital de la Pitié, and to an unsuccessful gastrostomy by Delassus,[220, Apr.26] which has given occasion to some very judicious observations on the legitimacy of the procedure, on some operative details, and on the modes of dressing and supplying aliment.

Unsuccessful gastrostomies have been recorded by Félix Legueu, J. F. Morse, and Le Bec.

From the clinic of Leyden, Klemperer[69, May 9], has reported a case of carcinoma with extension to the heart, producing gangrene of that organ, death having taken place by cerebral embolism.

ŒSOPHAGOTOMY.

Ed. v. Wahl$^{21}_{May\ 27}$ reports a successful case of œsophagotomy for removal of an incarcerated artificial denture. The œsophagus could not be recognized until the ectropœsophage of Vacca Berlinghieri had been introduced by the mouth. This instrument pushed the wall so far forward in the wound that the œsophagus could be seized and opened. The plate was found at the bottom of the wound, lodged in a horizontal position, and was readily extracted with forceps.

FISTULE OF THE NECK.

Our collaborator, Schiffers, of Liége, sends us an abstract of his contribution (International Congress of Laryngology and Rhinology, Paris, February) to the study of bronchial fistules, in connection with a case which he had observed in a man 30 years of age. The affection was congenital, and one of the patient's sisters had a similar fistule on the same side of the body. The fistule was incomplete, external, and situated on the right side just within the region of the sterno-cleido-mastoid muscle. The discharge had been serous at first, but had been purulent for more than fourteen years. It proceeded from the internal surface of a secondary bronchial cyst. This tumor was removed, with the cure complete in a few days,—at least, so far as concerned any further discharge of pus.

Schiffers entered into various considerations concerning the pathogeny, the diagnosis, and the treatment of this interesting affection, but few examples of which have been published in France or England. It is important to recognize the nature of the fistule by inspection of the throat, aided with catheterization. The excision of the cyst is to be preferred to all other operative procedures.

TRANS-ILLUMINATION OF THE UPPER AIR-PASSAGES.

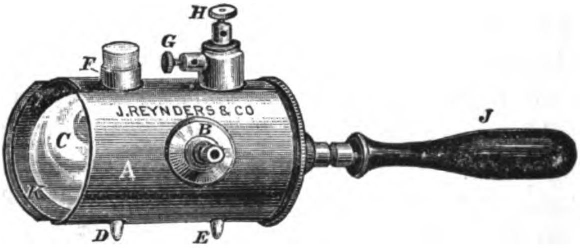
Considerable attention has been directed to trans-illumination of the upper air-passages by aid of the electric light, by means of which it is claimed that many points are sometimes determinable which are quite absolutely invisible by direct or reflected illumination.

Not many months before his death, the lamented Voltolini, of

Breslau,[385 Nov.,'86] described a perfected method of trans-illuminating the larynx by means of an Edison incandescent lamp, applied externally in a dark room, while the reflected image is viewed in a laryngoscopic mirror introduced into the unilluminated cavity of the mouth and pharynx. The lamp is backed with amalgam to act as a reflector, and is placed in a lantern, which also carries in front of the lamp a small, globular, glass vessel of cold water, which prevents the heat from incommoding the patient. This globe acts, likewise, as a biconvex lens to concentrate the light from the lamp.

The method succeeds best with thin subjects, but is also applicable, under favorable conditions, to women, men, and children alike.

Voltolini demonstrated his method on several patients before the Medical Section of the Gesellschaft für Vaterland Cultur, on October 26th and November 9th, among them a bearded man in whom ordinary laryngoscopy was difficult. He lays stress on the point that the carbon loop must be brought to a white glow to be effective.



FREUDENTHAL'S ELECTRIC LANTERN FOR TRANS-ILLUMINATION OF THE LARYNX.
(*Medicinische Monatsschrift*.)

W. Freudenthal, of New York,[150 Nov.] has modified Voltolini's electric lantern for illuminating the larynx from the exterior. His appliance consists (see cut) of an Edison electric lamp in a cylindric lantern, *A*, to which a handle, *J*, can be attached behind the lantern, or to its side, *B*, according as may be most convenient. In front of the incandescent lamp is a globular vessel of water, *C*, to prevent excess of heat upon the skin. Two openings in the bottom of the lantern, *D*, *E*, allow the tapering ends of the water-globe and of the lamp to protrude, and thus secure their steadiness. The globe is filled with fresh water by removing the cork, and is steadied in the lantern by a slot at the top, which secures the neck. The wires from the battery are attached to the incandescent lamp at *H* and *G*. The free open end of the lantern, *K*, is slightly concave, and is covered with rubber, the better to fit the neck and prevent any escape of the rays of light.

The examination must be made in a very dark room. When the current is on, and the lamp applied over the crico-thyroid membrane or the trachea, or at the side, as may be, the laryngoscopic mirror is then placed in the unilluminated mouth and reflects a translucent, reddish image of the larynx as a whole without differentiation of structure.

It is believed that this method will bring into view subglottic structures that are out of the range of the laryngoscopic mirror in the ordinary method of usage, and that it will, as hoped for by Voltolini, permit the differentiation of lesions of the vocal bands and other structures by the variations in the amount of translucence they exhibit.

Heryng $^{4}_{\text{Sept.2}}$ directs the light from Blänsdorf's diaphanoscope through a funnel-shaped pasteboard tube, the outer diameter of which is about 2½ centimetres, thereby enhancing the effect. The intensity varies with the locality. Too much light, he finds, destroys the effect and prevents accurate differentiation of the tissues. When the lamp is placed in the region of the crico-thyroid ligament the limits of vocal bands and ventricular bands can be distinctly recognized.

J. Gottstein, of Breslau, $^{60}_{\text{Oct.10}}$ has worked with Voltolini's apparatus and finds the following two points best adapted for the application of the lantern: the region between the upper border of the thyroid cartilage and the hyoid bone, and the region of the cricoid cartilage.

In the first position the entire interior of the larynx is beautifully illuminated, less so the epiglottis. In some individuals, especially females with erect epiglottis, the light is reflected clear onto the uvula and the palate, so that they appear in a reddish glow on inspecting the pharynx. The distinctness shades off below the vocal bands toward the trachea.

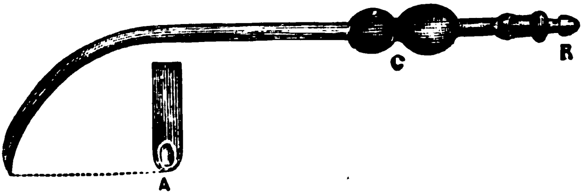
In the second position the trachea and the vocal bands appear almost blood-red, while the upper portion of the larynx is in shadow. Gottstein therefore recommends both methods to be employed in every resort to trans-illumination. To illuminate the pyriform sinuses, he recommends that the lamp be placed above the lateral borders of the thyroid cartilage.

INTUBATION OF THE LARYNX.

By E. FLETCHER INGALS, A.M., M.D.,
CHICAGO.

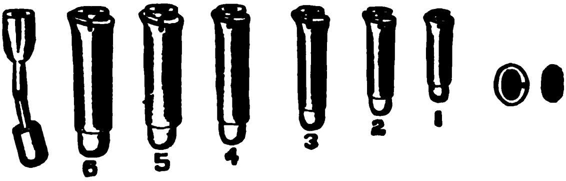
O'Dwyer's method for the relief of pseudo-membranous laryngitis has, during the last year, not only maintained its position with the profession, but gained ground both at home and abroad, as shown by numerous reports of cases, not only by those who had formerly used it, but by others who either have not employed the method at all or have actually opposed it. Besides the reports in our own journals, various articles have appeared in the German, French, Italian, and English periodicals.

As another evidence of the care and patience which have been exhibited by the originator of this method, we note that no changes of importance have been suggested by any one during the last year, and that the great majority of those who practice intubation have had the best success with the instruments which were given to the profession by O'Dwyer. However, some new instruments and some changes in the methods have been suggested and tried in a few cases, with more or less satisfaction to those who have experimented with them.



ANNANDALE'S LARYNGEAL CATHETER.
(*British Medical Journal.*)
A, A, tracheal end and opening; R, free end, to which India-rubber tube is connected; C, gag of hard vulcanite, which is movable along the tube.

Thomas Annandale,[2, Mar. 2] in an article on intubation of the larynx, in which he reports 1 case treated by O'Dwyer's method, recommends the procedure as an aid in certain operations involving the mouth and naso-pharynx, where bleeding is liable to take place into the air-passages and thus interfere with respiration; or, in operations in which respiration is not carried on satisfactorily during the administration of an anæsthetic, in which cases the laryngeal tube is used as a substitute for the tracheotomy tube and tampon.

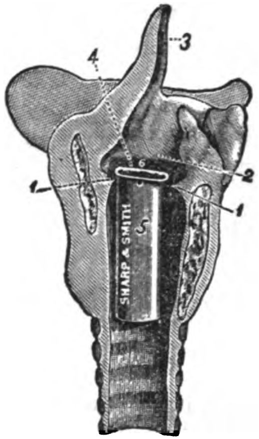


TASCHER'S SMALL TUBES (ABOUT HALF ACTUAL SIZE).
(*Chicago Medical Times.*)

For this purpose he specially recommends a long catheter, as represented in the figure on preceding page, which is carried into the larynx, but with the end allowed to protrude through the mouth.

John Tascher,[192 June] reports several cases of intubation, with very satisfactory results, and again insists upon the utility of his short tubes, which are represented in the figures shown on this page.

J. Mount Bleyer, of New York,[1 Feb.2] recommends daily laryngoscopic examinations of the patient, and in cases of young children advises forced laryngoscopy, which is made with the aid of his tongue-depressor, represented in Section G, vol. iv, ANNUAL of 1889, which appears to be a practical instrument. With this the tongue is forced downward and forward, so that, as he claims, a satisfactory

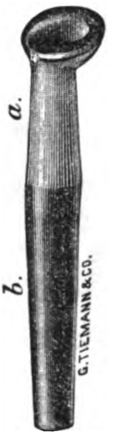


TASCHER'S SMALL TUBES.
(*Chicago Medical Times.*)

A, antero-posterior section of the larynx, giving a side view of the position of the tube in the larynx. No. 1, true vocal cords; No. 2, false vocal cords; No. 3, epiglottis; No. 4, head of the tube; No. 5, body of the tube; No. 6, ventricle.

view of the larynx may be obtained in young children. It is interesting to know that this may be done, although I cannot see what advantage is to be derived from frequent examinations of the larynx in cases of diphtheria in young children; so long as the obstruction, as indicated by respiration, remains, the treatment must be the same, and it would appear that the annoyance caused the little patient would much more than counterbalance any possible advantage which the physician might derive from satisfying his scientific curiosity.

He also[71 Aug.] describes an intubation tube similar in shape to that of O'Dwyer's, but constructed partly of hard and partly of soft rubber. This tube is made of hard and soft rubber, melted together. The head of the tube is made of wire and hard rubber vulcanized over the wire, making a firm head, thus preventing the possibility of breaking during extraction. The head is then melted on to the neck, *a*, which is of soft rubber, and the tracheal portion of the tube, *b*, being also hard rubber, is melted on to the lower soft part of the neck of the tube. By this combination the neck of the tube is soft and flexible, so that it may be compressed during the act of swallowing. This tube he first exhibited at the New York Academy of Medicine in May, and he claims for it more success in regard to complete deglutition than with any other tube that he has employed. Its advantages, as claimed by him, are its cheapness, light weight, its self-closing during the act of deglutition, thereby preventing the passage of fluids or other articles into the trachea.

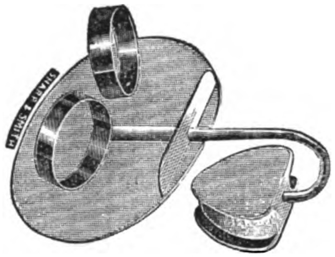


J. Mount Bleyer's Intubation Tube, (*Journal of the Respiratory Organs.*)

At the session of the American Medical Association, held at Newport in June, Charles Dennison, of Denver,[59 July] presented a new gag for which he claimed some special advantages, the chief being that when once introduced between the teeth it was impossible for the patient to prevent the mouth being opened or to displace the gag, and thus allow of the operator's fingers being bitten. In the discussion which followed I presented a simple gag devised by Ferdinand Henrotin, of Chicago, which I had used frequently and found very satisfactory. The principal advantages claimed for it over other gags are its simplicity and the ease with which it can be retained in the mouth by the assistant who holds the patient's head.

The method adopted by J. Mount Bleyer of daily extracting the tube, together with the intermittent intubation recommended by Francis Hubbard,[51 Ja.] has demonstrated the fact that it is often unnecessary for the tube to remain in the larynx more than two or three days to accomplish the desired result. J. Mount Bleyer says: "In a large number of cases it was seen that the tube had done its service by the second or third day, but with few exceptions it was re-introduced."

Regarding the size of the tube introduced, nearly all operators adhere to the scale recommended by O'Dwyer. J. Mount Bleyer says of this that he generally passes the tube of the correct size, and if it is coughed up he then introduces the size next larger. In contradistinction to this, Waxham[105 Apr. 1] says that he makes it a rule to select a tube smaller than the one that is marked appropriate for the age of the patient, and he attributes much of his success to this fact. He believes that many fail with intubation because they use too large a tube; the membrane becomes detached below it and sudden suffocation occurs, while if a small tube were used it would be expelled. However, he does not mention the danger of suffocation occurring after the tube has been coughed out before the physician can again be brought to the bedside. This danger is perhaps even more important than the one suggested by Waxham.



Ferdinand Henrotin's Gag.
(*Medical Record.*)

During the present winter I was called in consultation, and did intubation for another practitioner, leaving my instruments over night in order that the tube might be re-introduced if it should be coughed out. The dyspnœa was completely relieved by the operation, and the patient was doing well at 10 o'clock on the following morning, when the physician in attendance started to return the instruments. In the meantime, however, and before he could return, the patient coughed out the tube, and in less than an hour was suffocated by the closure of the glottis. In this case a tube of the proper size had been used, but if one larger had been employed it is possible that the accident might not have occurred.

Hubbard[51 Jan] recommends intermittent intubation, the tube of full size being replaced after a few days with a smaller one, in order that it may be eventually coughed out. He says: "If the symptoms in the case lead us to believe that the trouble is localized in the larynx and trachea, a full-size tube should be inserted. When membrane is suspected in the bronchi, or to relieve the recurring dyspnœa occurring in some cases upon removal of the large tube at the fourth, fifth, or sixth day, a smaller one should be employed in order that it may be coughed out. The time of wearing the tube is thus materially shortened; the spasm which sometimes occurs when the larger tube is removed on the fourth to the sixth day is relieved by the insertion of the smaller tube, and, when the latter is coughed out, usually in from six to twenty hours, the patient will be found to breathe without difficulty."

All writers, with one exception, concur in the statement that intubation is a much less difficult operation than tracheotomy, but this *one* maintains that the reverse is true. I have had considerable experience with both operations, and to me the difficulties of intubation, as compared with those of tracheotomy, are about in the same ratio as the difficulties of introducing a catheter compared with those of perineal cystotomy.

In the recently-reported cases the average results have been much better than formerly. This is attributed by different authors to various causes. Some lay stress upon the dexterity with which they introduce the tube, and others to the frequent removal of the tube and the feeding of the patient in the interval. But it appears more probable that the results are due partially to the subsequent management of the case, both as to feeding and medication, but largely to the character of the cases operated upon and to the type of the disease.

The feeding of patients wearing the laryngeal tube has been a matter of the greatest concern to all who have employed this method. The difficulties have been overcome by some, as just mentioned, by frequent removal of the tube; by others, in allowing only solid or semi-solid foods; and by still others, as well as myself three or four years ago, in withholding all fluids for the first thirty-six or forty-eight hours. Others recommend the use of the œsophageal tube, but the majority of writers seem to have overlooked the remarkably efficient plan which was suggested last year by W. E. Casselberry, of Chicago. This method, which was fully described in the last edition of the ANNUAL, consists in placing the patient's head as low as or lower than the body whenever the deglutition of fluids is attempted, and it has been found perfectly satisfactory in nearly all cases in which it has been adopted, the patient being able to swallow without any of the fluid passing into the trachea,

That the results of the operation are better than formerly is clearly shown by the statistics of various operators in a limited number of cases. For example, C. H. Hunter, of Minneapolis,[105/J—1] reports 52 cases with 16 recoveries, or 32 per cent. Tascher reports 29 cases, of which 44 per cent. recovered; J. Mount Bleyer, 206 cases, of which 33 per cent. recovered; F. E. Waxham, 60 cases, of which over 46 per cent. recovered; and from others similar reports have been obtained. As already stated, these results have been attributed to various causes. That, with the increased knowledge of the operation, the people should the more readily consent to its performance, and that with the perception of its ease physicians should more readily urge it, even in cases of no great severity, is at once apparent; therefore, it seems probable that one of the causes for these more favorable results is that some children are now intubated, where formerly the operation would not have been considered necessary.

But it is probable that the more careful attention to the case after the operation has been performed has much to do with bringing about these results, especially care as to feeding, and the administration of mercurials to prevent the extension of the pseudomembrane; yet it is also doubtless true that the type of the disease has changed in the last few months, just as we have seen it change in other years, and as we have seen other diseases change from time to time. I well recollect an epidemic of scarlatina which occurred about ten years ago, in which nearly 25 per cent. of the cases proved fatal, yet every physician is aware that during the last few years only a small percentage of these cases have been serious. The same experience has been noted by others, especially with respect to the therapeutics. Remedies, which, in the beginning of an epidemic have been shown to have little or no influence upon the disease, have, when used later on, been followed by the best results.

But, apart from these limited statistics, the showing for the operation is still favorable. Dillon Brown, of New York,[1 Mr.9] reports 2368 cases collected from the reports of 166 operators, principally in Germany, France, England, Spain, Canada, and the United States, with 647, or $27\frac{3}{10}$ per cent. recoveries. Our corresponding editor in Naples, Italy, Massei, mentions a number of successful cases, which will be described in a subsequent report.

INTUBATION IN ŒDEMA OF THE GLOTTIS.

This procedure has been employed in a few cases for the relief of acute œdema of the glottis. Altamirano (report of Semeleder, corresponding editor, Mexico[673 Oct.]) during the past year has had 1 successful case. Several cases have been reported in the United States. I have had 1 successful case, but am acquainted with a case occurring in the practice of a friend in which the obstruction to respiration could not be relieved by the laryngeal tube. This, of course, depends upon the portion of the larynx that is œdematous.

INTUBATION IN CHRONIC STENOSIS OF THE LARYNX.

Thomas Annandale, of Edinborough,[2 Mr.2] recommends intubation in certain cases of laryngeal stenosis from chronic inflammation or from accidental or surgical conditions. H. Ranke[84 Nos.28 to 30] refers to 2 cases of chronic laryngeal stenosis treated by intubation. In one the stenosis, which was due to granulations, was cured; the other, a case of congenital papilloma, was improved, but not yet cured.

In the discussion on Arpad Gerster's paper, read before the New York Academy of Medicine, February 26th, Dillon Brown[1 Apr.20] said: "In gumma and other forms of syphilitic stenosis we find the most brilliant field for this method. Without a formidable operation the dyspnœa is immediately and fully relieved. But, besides the curative effect obtained by the constant pressure of the tube, time is gained for the action of the internal medication. Until recently both O'Dwyer and myself had believed a permanent cure could not be obtained by dilatation in cicatricial stenosis of the larynx; so it was our custom to leave the tube in the larynx for twenty-four hours, which gave the patient relief for a month or two, when the process was repeated. More recently, we have become convinced that by constant dilatation, the tube remaining in the larynx permanently, the tendency to contraction of this cicatricial tissue could be permanently overcome. I have under observation at present 2 cases, one having gone six months and the other over a year, without recurrence, both of whom had laryngeal stenosis due to syphilis."

I have had 1 similar case in which, after the tube was worn continuously for three months, there was no subsequent tendency to contraction of the glottis.

INTUBATION FOR FOREIGN BODIES IN THE LARYNX.

S. J. Metzger, of New York,[59 Sept. 21] reports the case of a boy 3 years of age, who, while crying with his mouth full of food, was suddenly seized with a choking spell. About twenty hours later the symptoms were those of a case of advanced croup. Three hours afterwards tracheotomy was advised, but owing to the difficulties of the operation, and as the child was already comatose, immediate measures were necessary; one of O'Dwyer's tubes was introduced into the larynx, and relief was at once obtained. The string had been left attached to the tube, and during the following night the child pulled it out, when it was found to contain, besides a large amount of viscid mucus, a comparatively-large pointed piece of nutshell.

Metzger states that, as far as he can learn, this is the first case where intubation has been performed in the treatment of foreign bodies in the air-passages. He says further: "Although this case terminated satisfactorily, it is yet apparent that this method will not only be of no avail in some cases, but that it will, on the other hand, work direct mischief in many others. I shall therefore attempt to state the conditions under which intubation in cases of foreign bodies in the air-passages appears permissible and advisable. First, where we can with great certainty assume that the foreign body lies in the trachea or in the bronchus. In this case there exists no contra-indication. In all these cases intubation should be performed and developments awaited. If the foreign body be smaller than the lumen of the tube it will be dislodged by the severe coughing attacks always present, in addition to which the fluids which now and then flow down through the open tube, may also be of service in facilitating its removal. If the foreign body be larger than the lumen the success of tracheotomy will not in any respect be impaired, if compelled to resort to it after the unsuccessful issue of intubation.

In cases where the body dwells in the larynx it is different. If the foreign body be sufficient to occlude the glottis, and the first choking attack does not pass off, then certainly tracheotomy should at once be preferred if there only exists a possibility of performing it. If, for some cause, such a possibility be not present, then an attempt should be made to push the foreign body into the trachea by means of intubation. The trachea is much wider than the larynx, and what fills the former will allow the passage of air in the latter; besides, the tube lying in the larynx will prevent the foreign body from being lodged in it, so that by intubation a respite is gained for the possibility of a subsequent tracheotomy.

In cases where the foreign body does not occlude the larynx it is difficult to arrive at a conclusion. If the stenosis has assumed a dangerous aspect, and if it be for some reason impracticable to perform tracheotomy at once, then we ought unhesitatingly to intubate, and we may often avoid a subsequent tracheotomy, as the case above described shows. But if the case is not as yet urgent, and tracheotomy can be performed with as great facility as intubation, then, in my opinion, it would be more rational to tracheotomize. If we certainly knew that the body could pass through the tube, then, in my judgment, intubation would be certainly indicated, with the certain presumption that the body would be coughed out."

Doubtless, one would often be disappointed in this presumption, for a body, even though small enough to be readily expelled through the tube, would be quite likely to pass up between it and the sides of the trachea, instead of passing through it. Sajous' tube,[1 Oct.23,'87] shown at the American Laryngological Association meeting, in 1887, would, however, obviate this difficulty, if it should prove practical for it to be retained in the larynx. Its shape, when inserted, approximating very nearly that of the internal aspect of the laryngeal cavity, and the instrument being made of thin metal, it would offer no impediment to the extrusion of the foreign body.

Unfortunately, the inventor, through excess of occupation, has not since that time been able to give the instrument the attention necessary to perfect it.

DISEASES OF THE THYROID GLAND.

BY FRANKLIN H. HOOPER, M.D.,
AND
J. PAYSON CLARK, M.D.,
BOSTON.

ANATOMY AND PHYSIOLOGY.

DEFAUCAMBERGE[126, July] says the thyroid body is a gland whose development is like that of the racemose variety. It is made up of a series of primitive lobules separated from each other by walls of connective tissues. The primitive break up into secondary lobules composed of acini. Acini of the same lobule communicate. The contents of the acini is a true mucus, containing hyaline corpuscles, *débris* of cells, and nuclei of disintegrated cells. The colloid substance is reproduced at the expense of the nuclei of the disintegrated cells.

Ribbert[20, July 1] proves, by a series of experiments on guinea-pigs and dogs, that a regeneration of the functional components of the thyroid takes place, as in other glandular organs.

Shepherd[282, May] reports an unusual origin for the inferior thyroid arteries,—the right from the right common carotid, the left from the innominate; also, in another case, a very large thyroides ima, four large trunks of which completely covered the central part of the trachea.

MALIGNANT TUMORS.

Diagnosis.—R. Matas[12, Mar.] and P. S. Hutchinson[2, July 20] each report a case in which the microscopical examination illustrated the difficulty of diagnosis between cancer and sarcoma of the thyroid. P. Berger[152, Apr. 30] reports a total thyroidectomy of an annular constricting goitre, followed by temporary cachexia strumipriva. Microscopical character was epithelial, but there was no return in nine months and no glands in the neighborhood. It resembled much, histologically, Virchow's hyperplastic goitre. R. N. Wolfenden[22, Dec. 12, '88] says malignant tumors of the thyroid, though rare, are more common in men than in women,and usually develop from pre-existing goitres.

Treatment.—In a case of sarcoma of the thyroid, in which tracheotomy failed to relieve dyspnœa, caused by pressure on the pneumogastrics, J. Solis Cohen$^{1}_{\text{Aug.10}}$discovered that irritation of the mucous membrane of the trachea gave temporary relief.

Poncet$^{3}_{\text{Oct.16}}$gives an operation for the relief of the pain and dyspnœa from cancer of thyroid, the principal steps of which are: 1. Crucial incision over the tumor. 2. Freeing and division of the hyoid and thyroid muscles which envelop it. 3. Liberation, and raising the tumor with the index finger to loosen it as much as possible from the deeper parts. 4. Suture and drainage. He cites a case of a man, literally smothering before the operation, who lived four months after it.

GOITRE.

Diagnosis.—An interesting monograph on aërial tumors of the neck has been published this year by L. H. Petit.$^{91}_{\text{Feb.,Mar.,May,June}}$ The substance of the thyroid may form the wall of an air-tumor which has extended into it from the trachea. In these cases, whether through arrest of development or through a hernia or rupture of the tracheal walls at a level with the thyroid, the air has come into gland, separated the lobules, and formed a pocket. A case is recorded where the tumor was in the cellular tissue between the trachea and the thyroid, and another where the thinned and distended lobes of the thyroid formed part of the anterior wall of the tumor.

GOITRE.	AERIAL TUMOR.
Not affected in volume by respiration.	Changes in volume; increases with expiration, cough, etc.; diminishes in deep inspiration and forced extension of the head.
More or less firmness.	None.
Bi- or tri- lobed, sometimes with prominences or large vessels on surface.	No such appearances.
Does not disappear on compression.	Disappears on compression.
No alteration in voice.	Frequent modification of voice.
Dullness.	Resonance on percussion.

Puncture will aid in diagnosis, a jet of air showing the nature of the malady. Aneurismal goitres are at times reducible a third or two-thirds, but not more. If an hypertrophy of the heart exists at the same time as the aërocele, one might think of exophthalmic goitre, but could easily reject this hypothesis by the absence of exophthalmus, of pulsations in the tumor, and by its reducibility. One case is recorded of the co-existence of goitre and aërocele.

Tillaux[85, Sept.30] gives the following points in the diagnosis of a polycystic tumor of the thyroid: The rounded form, not at all recalling that of the thyroid in its normal state; the tendency to ascend, whereas hypertrophied lobes of the thyroid tend to descend. To assure one's self of its connection or otherwise with the trachea, the head is extended as far as possible to immobilize the larynx and trachea. A movement is then made to raise the tumor. If even a slight displacement takes place the tumor is enucleable without the trachea coming into great danger. Sometimes, however, the trachea is so softened that several rings can be dragged with the tumor, so that caution is necessary.

Treatment.—Terrillon[67, Sept.30] gives the following directions for the use of tincture-iodine injections: 1. Be sure that the needle is in the body of the tumor before injecting. 2. Avoid, as far as possible, the veins distributed in the cellular tissue over the tumor; it is often useful to have the patient make some effort in order to bring out the veins more clearly. 3. The syringe must be aseptic; it must be plunged slowly but without hesitation into the gland. The syringe must then be taken off to see that no blood flows from the needle. This precaution is necessary to avoid injecting into a vein. Inject very slowly; 0.5 gramme (8 minims) is enough for the first injection. If this is well borne (*i.e.*, only slight pain with little swelling is caused), 1.0 gramme (15 minims) can be used next time. Wait a few seconds after making the injection before removing the cannula, so that the liquid may be sufficiently diffused into the glandular tissue so as not to flow out into the subcutaneous cellular tissue; only one injection to be made at a sitting, and an interval of four or five days to elapse before the next to avoid any chance of iodism. There is considerable radiating pain for a short time after the injection, also a metallic taste in the mouth for a few hours. One or two days after there is a slight swelling in the thyroid region, due to inflammation provoked by the injection. Suppuration is avoided by sufficient care and cleanliness.

In the event of transfixing a vein the blood may flow into the cellular tissue. By means of compression this readily disappears.

One injection rarely has been sufficient. Sometimes twenty are necessary. In some cases recovery seems to be complete when the thyroid begins to enlarge again. This is due to the continued growth of the posterior part of the gland, which has not been reached by the tincture iodine, and can be treated in the same way. Tincture iodine is the best substance for injection. Iodoformed ether (20 per cent.) and Fowler's solution have been used, the latter, on account of its poisonous property, only in drops.

Terrier$^{73}_{\text{Dec. 1, '88}}$ reports a goitre the size of a hen's egg reduced to that of a small nut in nine months with one hundred injections of 5-per-cent. iodoformed ether!

Schwartz$^{35}_{\text{May 23}}$ says that interstitial injection of pure tincture iodine is the most efficacious and least dangerous of all methods of treatment for ordinary cystic goitre.

Raymond$^{136}_{\text{Sept. 15}}$ says injections to the number of four or five can be tried in small cystic goitres. When the cysts are large, with more or less thickened walls, or thick contents, or manifestly multilocular, both these authors advise enucleation.

At a recent Congress of German Physicians and Naturalists, Heymann, of Berlin, reported a case$^{9}_{\text{Nov. 23}}$ in which a goitre had diminished one-third after injection of tincture iodine twice a week for four months. The last injection was followed by convulsions and death, due probably to thrombosis. He had collected 16 cases of death after parenchymatous injections. Same results may follow from the injection of perchloride of iron, ergotine, or other drugs.

Duret$^{220}_{\text{Feb. 22}}$ says this method is only applicable to small, serous cysts. He speaks of the tediousness of treatment by injection and the dangers of hæmorrhage, suppuration, and thrombosis.

Lacaille$^{782}_{\text{July}}$ gives a method of electrolysis by which he does not claim to remove the goitre, but to reduce very much its size and relieve the concomitant symptoms. Unfortunately, the treatment must be of long duration, as it is necessary to use very weak currents to avoid local injury. All that is necessary is a battery of 20 to 25 cells, an ordinary rheostat, and a well-made milliampère-meter. The patient is placed upon the back in an ordinary operating chair, and the throat and one arm exposed. To the arm is fastened a well-covered, wet electrode (positive pole); the surgeon then grasps the tumor with the left hand and passes deep into it the electrolysis needle in connection with the negative pole. An assistant withdraws the rheostat until the meter measures 6 or 7 milliampères. In ten seconds the rheostat is gradually replaced, and when the meter-index indicates zero the needle is withdrawn. The number of punctures and the intensity and duration of the current should correspond with the feelings and tolerance of the patient. One case is reported of disappearance of a small goitre in three months, applications every other day; another, of diminution in size in five months, application one to three times a week. E. F. Ingals, of Chicago,[673 Sept.] reports 2 cystic goitres successfully treated by electrolysis.

Kocher[214 No.1] reports a further series of 250 cases of goitre operated on surgically. Of these cases, 6 ended fatally, a mortality of 2.4 per cent. Of these 6, 3 were malignant (of 20 such operated on) and 1 exophthalmic (of 5 such cases). Excluding these, the death-rate would be 0.8 per cent. Treatment, aseptic. Catgut definitely given up. It remains an essential condition in all thyroidectomies that a functionally active part of the thyroid be left. Kocher would ligature all the arteries only in cases of exophthalmic goitre. Enucleation is easier and safer than extirpation, but it is doubtful whether it protects against recurrence. In general, extirpation is the operation for malignant or diffuse, enucleation for nodular, disease. Special care should be taken not to wound the recurrent laryngeal and cardiac branches of the sympathetic. French surgeons, as a rule, favor extirpation. C. Audry and A. Poncet, of Lyons,[55 Oct.12] condemn every other procedure. Duret,[55 Oct.12] Chrétien,[11 Apr.] Zesas,[226 B.36,p.732] and Bose[336 Jan.5] favor enucleation where possible. The latter used an elastic ligature around the base of the affected lobe during operation to avoid hæmorrhage. If both lobes are affected, only one is done at a time.

L. Brown[2 Dec.1,'88] reports 3 cases of relief of dyspnœa after removal of the isthmus. Wolf[41 Mar.31] reports 2 such cases G. Stoker[2 Dec.1,'88] reports the disappearance of a small goitre after repeated cauterization of the hypertrophied middle turbinates. He attributes the result to the reflex irritation of the vasomotor nerves.

Rydygier, of Cracow,[336 No.14; 96 Sept.] reports 12 cases of goitre treated by ligating afferent arteries. Only 2 not cured; one in which on' two arteries were tied, the other a cyst. The most favor s and cases for this operation are fairly-recent parenchymatous ostemi-

and very vascular forms. That gangrene does not follow tying all four arteries is now shown by 14 cases.

Siry[24, June 30] reports complete cure of a cystic goitre by puncture and evacuation. Schwartz[91, Dec. 10, '88] reports 2 cases of adherent cysts cured by drainage. Dardel[1010; 11, June] gives three methods for treating hydatid cysts of the thyroid: 1. Puncture with injection of parasiticides. 2. Incision. 3. Enucleation. The last is preferred.

M. A. Wolfler[35, Sep. 26] reports a case of migratory goitre causing occasional attacks of cyanosis and dyspnœa. A small, movable tumor was seen on the right side of the neck. The tumor migrated at times toward the mediastinum, compressing the trachea and right innominate vein. Removal of a few adenomatous nodules and fixation of right half of thyroid resulted in a cure.

Caselli[336, Sept. 28] attributes alterations in the cartilages of the larynx and trachea not, as do Brown and Kocher, to nutritive troubles caused by compression of the inferior thyroid arteries, but to direct compression by the tumor.

EXOPHTHALMIC GOITRE.

Etiology.—R. G. Curtin[1006, Sept. '88] has collected 40 cases of Graves' disease in fifteen families. He concludes that heredity is probably the predisposing cause in all cases. An elevated region is one of the exciting causes. Anything tending to excite or disturb the quiet of the nervous system may be another.

L. Jumon[152, Aug. 27] suggests that we might consider, as does Jaccoud, the goitre and the exophthalmos as consecutive to the palpitation and arterial dilatation. H. R. Hopkins[1, Feb. 16] considers anæmia a possible cause. Dauscher[113, Feb. 17] reports a case coming on after climbing rapidly a steep mountain. No neurotic predisposition was discovered.

Pathology.—Leflaive[100, Jan. 12] says that a neurosis is the only satisfactory conception of the disease.

W. H. White[2, Mar. 30] reports a case in which hæmorrhage in the floor of the fourth ventricle was found following pneumonia. He concludes that this shows special weakness at this point, and must therefore be the seat of the disease. Another reason for this conclusion is that patients with Graves' disease are particularly liable to die suddenly.

Hammar[372] reports a case in which the sympathetic nerve was not altered. Schott[41, Apr.18] says this disease is due to the affection of some yet unknown brain-centre.

Symptoms.—Millard[1010, '88] says that œdema is far from always having a grave significance. It may be developed in the absence of any cachectic condition or valvular lesion. Vasomotor innervation troubles, permanent or transitory dilatations of the heart or its enfeeblement, anæmia, and chlorosis are the conditions which favor its developement.

Charcot[14, Feb.3] gives the following symptoms which may occur besides the classical trio: Elevation of temperature of one or two degrees (the urine presenting no febrile character); muscular trembling constant, uniform, uninfluenced by voluntary movements (the myograph shows eight or nine oscillations a second, the most rapid type of trembling known); sensation of warmth (thermophobia); giving way of the legs (mild paraplegia) without spasmodic phenomena or lancinating pains.

A. Eulenburg[4, Jan.14] says that a low electrical resistance is frequently found in Graves' disease. In doubtful cases it is a valuable positive sign, but its absence in such cases has no weight.

Complications.—A. Eulenburg[4, Jan.7] reports a case with dark coloration of the skin as a complication which he diagnosed Addison's disease. Oppenheim[69, V.14,No.2,'88] has reported a similar case. A. R. Manby[2, May 11] mentions a number of cases of diabetes and Graves' disease occurring in the same families. H. Barnes[2, June 1] mentions a case complicated with diabetes. Ballet[17, No.20] and A. Joffroy[363, V.24,No.1] believe that exophthalmic goitre and tabes can exist as separate affections in the same patient.

Treatment.—This will vary more or less according to one's theory of the disease, whether anæmic, functional, cardiac, neurotic, or thyroid. Eulenburg[4, Jan.21] advises a sanitarium in a high altitude for most cases. In some few cases such altitudes are not well borne. Climatological treatment is aided by balneo-therapeutic, dietetic, and electro-therapeutic measures. Eulenburg recommends the lighter forms of cold-water treatment and carbonic-acid baths. For dietetic measures the Weir Mitchell or Playfair cure, milk and koumiss cures. As to electricity, hydro-electric baths, as specially developed by him, together with general electrization.

Schott[41, Mar.2] believes in much the same treatment, with tonics and strengthening diet. H. Dauscher[113, Feb.17] recommends, besides abstemiousness from meat and spirituous drinks, the use of cold compresses to the eyes and heart.

Jumon[152, Aug. 27] says treatment by high altitudes is not always successful. H. Mueller[214, Apr. 15] reports the case of a child cured in six weeks with inunctions of iodine ointment, and iron and arsenic internally.

Valieri[26, Mar.] cites 3 cases improved by the administration of cultivated hemp. The tincture and resin are two of the best preparations. Thyssen[73, Jan. 26] reports a case, with well-marked heredity, cured in two months after twenty-two injections of pure iodine. Hopmann[4, Oct. 15, '88] reports a case in which treatment of pharyngitis sicca and removal of nasal polypi caused amelioration of the symptoms of Graves' disease. B. Fraenkel[69, V. 14, No. 2] saw appearances resembling this disease subside after cauterization of the mucous membrane of the nose.

F. Semon[2, Apr. 20] saw removal of polypi from the nose bring on right-sided exophthalmos. There was no struma or palpitation. Five similar cases are on record. Ch. Audry[14, June 6] collects 12 cases of exophthalmic goitre treated surgically, from which he concludes the prognosis of surgical intervention is grave. The nervous amelioration in those operated on has not been confirmed often or long enough to allow of the opinion that the removal of the goitre can cure the affection. Incomplete interventions (caustics, incisions, etc.) are often useful.

MYXŒDEMA.

Pathology.—Ord[1038] says, in concluding this summary: "Finally, it may be stated that there is strong evidence that myxœdema, sporadic and endemic crétinism, cachexia strumipriva, and the operative myxœdema of animals are severally species of one genus, and that the one pathological factor common to all these conditions is the occurrence of morbid processes or of operations involving the annihilation of the function of the thyroid body."

C. H. Dixon,[16, May 1] Tissier,[33, Jan.] and R. Romme[164, June 27] consider myxœdema to be due to a functional destruction of the thyroid.

The thyroid is diminished in size, and its glandular structure replaced by fine fibrous tissue.[1038] In the skin there is nuclear hyperplasia and increase of the connective tissue chiefly about the hair-follicles and the sweat and sebaceous glands. The interspaces between the fibrous bundles are widened as if by œdema, not due to ordinary serous fluid, but to a gelatinous substance not flowing out when the tissue is cut. The falling out of the hair is attributed to the changes in the skin, and the decay and loss of teeth to similar changes in the mucous membrane of the mouth. No important changes are found in the nervous system. The increased bulk of the body was found to be due to overgrowth of subcutaneous fat. The interstitial changes in the skin and viscera seemed to be of an inflammatory character and to have nothing specific in their nature. Halliburton, in a chemical examination of the tissues, did not find a great increase of mucin. This is attributed to the circumstance that most of the patients died, not in the swollen, myxœdematous stage, but in the later atrophic condition.

Etiology.—H. Hun[July, 5 Aug. '88] tabulates 154 cases, 4 not before published. He mentions as sometimes apparently causative: Excessive child-bearing, injuries (especially to head), mental shock, hæmorrhage. The last, being a common symptom, may have been simply an early symptom in these cases.

Symptoms.—Besides the well-known symptoms the English Myxœdema Committee call attention[1038] to the frequency of delusions and hallucinations occurring in nearly half the cases, generally when in an advanced stage, and to the insanity which occurred in nearly the same proportion of cases (acute or chronic mania, dementia, or melancholia). Tremors and contractions of the hands and feet, similar to those observed in monkeys after removal of the thyroid, were noticed in some cases. Moles and warts on the skin and hæmorrhages are also noted as more or less frequent symptoms. Women are affected more frequently than men in the proportion of 6 to 1. H. Hun[July, 5 Aug. '88] says 3½ to 1. The committee[1038] suggest that possibly the thyroid is functionally more active in women than in men, and therefore more apt to be attacked by degenerative changes. The disease may occur in youth or old age; most common in middle life. Hun says electrical excitability is diminished in at least 60 per cent. of cases where this test was noted.

Treatment.—The committee consider that warmth has a decidedly beneficial effect, while exposure to cold aggravates all the symptoms.

Complications.—Bourneville[3, Sept. 4] says that co-existence of idiotism and myxœdema is not very common. Twenty-five cases on record. A. Gimeno[767, No. 36; 6, Apr. 20] reports a case of myxœdema in a typical crétin.

CACHEXIA THYREOPRIVA.

Munk and Drobnick,[273, B. 26, H. 2] from independent experiments on animals, conclude that the symptoms of this disease are produced by irritation of the nerves in the neck through suppuration or the process of healing of the wound, and that the thyroid is of little or no physiological importance. Langendorff[319, p. 46] favors the above opinion.

Weil[88, Nos. 14, 15] shows, from experiments on dogs, that cachexia thyreopriva is really a consequence of abolition of the thyroid. He believes in its importance to the central nervous system.

F. Fuhr[273, Feb. 21] says that after removal of the thyroid in dogs supplementary glands in the neck or thorax are always found if the animal survives the operation long enough.

Schiff,[3, Sept. 18] after operations on 52 dogs, following the indications of Munk, still holds to the importance of the thyroid. Fano,[3, Sept. 18] after similar experiments, is of the same opinion as Schiff.

H. V. Wyss,[214, Mar. 15] from operations on four animals, has obtained results which agree completely with those of Fuhr and Schiff. Tarchanoff[3, Sept. 18] says that experiments made at St. Petersburg do not confirm Munk's results. Herzen[197, Feb. 20] has been unable to cause symptoms of cachexia thyreopriva by simple irritation of the nerves of the neck. H. Schwartz[1037, '88] concludes from experiments that it is impossible for the symptoms to be due to irritation from the wound.

Ewald[4, No. 15] opposes Munk's theory. He says that Schiff gives as a reason for its frequent non-appearance in men after total extirpation of goitres, that the gland had gradually lost its functions as the goitre grew, so that when extirpated it was essentially entirely or in part out of the body. He speaks of the removal of half the thyroid and other operations involving large wounds in the neck in dogs, from which no cachexia resulted.

Schiff[13, July 15] says the thyroid furnishes a secretion whose presence in the blood is necessary for the nourishment of the nervous system. Golgi and Rogowitsch state that it removes an unknown ferment product whose accumulation in the blood is injurious to the nervous system. H. V. Wyss[214, Mar. 15, '89] considers it a plausible hypothesis that the sickness and death of animals, after total extirpation of the thyroid, is due to poisoning (analogous to uræmia) caused by the retention of a substance in the blood usually eliminated by the thyroid. Albertoni and Tizzoni[276 Aug. 80] say that the blood-corpuscles here acquire the capability of fixing oxygen. Zesas[13 July 15] thinks it is a regulatory apparatus for the circulation of blood in the brain and nerves; also forms blood.

Caselli[91 Sept.] presents a report of 78 cases of extirpation, 14 of which being so-called total. In the case of a young woman, symptoms of cachexia thyreopriva showed themselves. These soon began to diminish rapidly. Caselli attributed the improvement to the growth of a small tumor in the thyroid region, which he considered a supplementary thyroid. In young persons to whom the thyroid is necessary it would be useful to always leave in place a small portion of the gland. Horsley[1038] says that the great importance of the gland in young and growing animals is universally admitted. In rodent animals no symptoms were caused by extirpation of the thyroid, but in carnivora they were almost invariable. They are dullness, apathy, fibrillary muscular twitchings, violent clonic convulsions, dyspnœa, and gradually deepening coma. In monkeys two forms of cachexia thyreopriva were noted, viz., an acute form, more apt to occur in young animals and distinctly induced by exposure to cold, and a chronic form, if the monkeys are well cared for and kept at a temperature of 90° F. (32.2 C.), life being prolonged from an average of twenty-four in the acute cachexia to one hundred and twenty-five days. In the latter form the mucinous degeneration was replaced by marasmus, and mental disturbances became the most prominent feature among the special symptoms. The animals in all cases resembled crétins in every particular. The chemical analysis of the animal operated on showed a great increase in the percentage of mucin in the skin, tendons, and salivary glands (parotid, in which there is normally no mucin). In the chronic cases this excess of mucin was not found. Horsley concludes that the loss of the thyroid is the cause of the symptoms, and that myxœdema, as it occurs in the human subject, is due to the same cause, "that some as yet unknown condition (possibly of the central nervous system) causes atrophy of the thyroid gland, and consequent upon this are developed the symptoms of cachexia, known in its various forms as myxœdema, crétinism, and cachexia strumipriva."

F. Semon, from a review of a large number of extirpations of goitre in the human subject, concludes that the risk of cachexia developing is greater in individuals whose physical development is not yet entirely terminated. Since the proportion of the cases in which myxœdema followed complete removal is only 1 in 3, Semon concludes that the hypothesis of a connection between the removal of the gland and the cachexia cannot be maintained. Ord, in the general summary of the report, draws attention to the fact mentioned by Semon, that cachexia strumipriva has not followed any other operation in the neck involving the great vessels and the sympathetic nerve, and adds: "It is the explanation of the non-occurrence of myxœdema in operative cases which has to be sought, not the justification of the clearly-established fact that myxœdema follows one operation and no other."

INEBRIETY, MORPHINISM, AND KINDRED DISEASES.

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ALCOHOLIC INEBRIETY.

UPON this subject there is but little worth reporting aside from the two principal events of the year, namely, the meeting of the International Congress for the Suppression of Alcoholism, at Paris, and the debate on the pathology of chronic alcoholism before the London Pathological Society. Although there has been a great deal of agitation respecting the management of inebriates, and concerning the regulation of intoxicating beverages, particularly in England, but also in the United States and on the Continent as well, yet there has been little change in the position of the different advocates during the year. Articles are sufficiently numerous showing the enormity of the evils of alcoholism and the defects in our social and legislative systems respecting this question, but the difficulties preventing a solution of these intricate problems are being but slowly evolved, if we may judge from the literature. Kempf,[198 Jan.] Haller,[109 Jan.] Haigh,[43 June] and Crespi[26 Oct.] advocate the commitment and management of inebriates by the State in special asylums. Terry,[72 June] Bird,[81 Nov.] and Wright[98 July] present papers on forms of drunkenness, its pathology and management; and Atchison,[120 Jan.] Carson,[44 Feb.] and Coleman on the general effects of alcohol. Mosler[650 Dec. 13, '86] reviews the state of the alcohol question on the Continent, and Rochard[208 June 22] has an interesting paper on voluntary intoxication. Crespi[26 Dec., '86] presents "An Abstainer's Defense," and Mann[60 Feb. 2] has collected the views of a large number of European authorities in recognition of inebriety as a disease. Lancereaux[100 p.838] and Raymond, in clinical lectures, report examples of chronic alcoholism. Cohn[4 Dec. 24, '86] reports a case of delirium tremens in a child 5 years of age, and cites other cases in literature. Porritt[6 Jan. 19, '86] records an account of an epidemic of lead poisoning in an English community due to the water-supply carried in lead pipes, and calls attention to the more pronounced effects observed in those patients who used alcoholic beverages, showing the influence of alcohol in intensifying the effects of lead. Chenery's voluminous series of papers on alcohol, the publication of which has extended over a period of nearly two years, is at last finished.[60 Jan.] It is a compilation containing a vast amount of information, collected from many sources, and embracing a discussion of the chemistry of alcohol, its physiological action, and particularly its relation as a poison, a food, and a medicine. His conclusions are strongly against its having any food value and against its use as a medicine. In a discussion on the Morton Bill for the establishment of institutes for inebriates, etc., carried on before the Medico-Chirurgical Society of Edinburgh, Tuke[36 July] stated that he was not prepared to admit unreservedly that insane drinking, or dipsomania, was synonymous with habitual drinking, or that habitual drinking was necessarily disease. He drew a distinct line between vicious drinking and insane drinking, and it was only in the latter condition that he thought they had any right to ask for legislative measures of control,—control meaning seclusion from society. Who should be the active agent in procuring such control? Was it to be the doctor who was to decide between vice and insanity? He thought that that was too much responsibility to be placed on the shoulders of any one man. Was it to be a member of the family? This would be to adopt a *lettre-de-cachet* system, open to great abuse. He favored Skae's suggestion, made long ago, that a proper court would be one consisting of the sheriff of the county, assisted by a medical assessor, a representative of the inebriate, and a representative of the family. They should have the power of deciding for what length of time the patient, if insane, should be secluded. Clouston, in the same discussion, said that the latest investigations into the functions of the brain proved the relation between drunkenness and disease, and tended toward the idea that the practice of alcoholic drinking in certain cases is a disease.. He differed from Tuke in thinking that ordinary insane asylums were not the proper places for dipsomaniacs; they did not mix well with the insane class, and could not be detained long enough to do any real good. To attain favorable results they must place the drunkard under proper care at an early stage. The confirmed cases were nuisances to society and their friends.

If the dipsomaniac interfered with society, he and his liberty would have to go to the wall.

A new law in Minnesota punishes drunkards by a fine of from $10 to $20 or imprisonment of from ten to forty days for the first offense, not less than thirty days' imprisonment or more than sixty, or a fine less than $20 or more than $50, for the second offense, and for the third offense not less than sixty or more than ninety days' imprisonment.

The debate before the London Pathological Society$^{2}_{\text{Dec.8,'88}}$ on the pathology of chronic alcoholism was opened by Payne, and continued by Harley, Lionel Beale, Mackenzie, Mott, Dickinson, Buzzard, Pitt, Findley, Savage, Sharkey, Hadden, Ormerod, O'Conner, and Pearson. The following excellent editorial summary$^{2}_{\text{Jan.19}}$ gives a just review of the somewhat diffuse and voluminous report of the discussion: "The kind of change produced by alcohol, when it produces any change at all, is essentially the same in all the organs of the body,—degeneration of the parenchyma and increase of the connective tissue. As to the liver, the question of which of these two is the primary change was answered by a considerable mass of testimony, showing that the accepted teaching—although challenged by Payne in his opening speech—is the correct one. In this organ, then, we must believe that the change is primarily an increase of connective tissue in the portal system, and that the parenchyma is generally only affected later. Not only did the majority of speakers support this idea very strongly, but Sharkey showed some sections of liver from a case of advanced cirrhosis, in which there could be no doubt that, lying alongside markedly increased bands of connective tissue, were perfectly normal hepatic cells.

"It was, perhaps, natural that the centre of interest in the discussion should be the nervous system. The remarkable fact that few, or only inconstant, changes have been found in the brain-cells (seeing that their functional disturbances are so obtrusive) is probably to be accounted for, as suggested by Savage, on the ground that their blood-supply is so good that the poisoning of the brain-cells is only transient, the blood quickly washing away the alcohol from them, and restoring them to a normal condition; all speakers, however, agreed that a drunkard's brain is a wasted brain—a senile brain. Savage gave some very interesting facts with reference to the relation of alcohol to the various forms of insanity, showing, first, that it was undoubtedly a cause, though not a common one, of neurotic tendencies, not only in the individual, but also in the family; and, secondly, that, contrary to common belief, it was only rarely a cause of general paralysis.

"Changes in the spinal cord, though occasionally found, are not constant. This, perhaps, is not so remarkable when it is considered how other toxic agents exert their influence on special portions of the nervous system (for example, curare on nerve-endings in muscle). The specimens shown of sections of nerves in alcoholic paralysis clearly demonstrated double changes of a neurotic character—parenchymatous and interstitial. Here, again, the question arose as to which, if either, should be considered the primary change; but the evidence collected is not yet sufficient to decide this point. Inflammatory and degenerative changes were shown by Hadden and Ormerod in the muscles innervated by the diseased nerves, and possibly the fatty changes found in cardiac muscle by Mott were directly dependent on neuritis of the vagus.

"Sharkey suggested that the frequency of pulmonary phthisis in cases of alcoholic neuritis might also be due to trophic changes in the lungs, disease of the branches of the vagus leading to a condition of these organs which rendered them a suitable nidus for the tubercle bacillus. Very little histological evidence of disease of sensory nerves was adduced, though several significant facts were mentioned. Thus, Hadden described various skin lesions; and changes in the sensory nerves of muscles, evidenced by loss of knee-jerk and ataxia, have been observed as some of the earliest symptoms of alcoholic neuritis. Sharkey mentioned some remarkable changes seen in the retinæ of a patient suffering from severe, though non-fatal, alcohol paralysis. This case, however, was complicated by the transient presence during the illness of albuminuria. Ormerod mentioned ophthalmoplegia from disease of the oculo-motor centres produced by alcohol as having been described in Germany by Wernicke and Thomsen; no cases have been recorded in this country, though Ormerod stated that two had been seen,—one by Suckling and another by himself.

"The main stress of the discussion fell, as we said above, on the known changes in the liver and in the nerves. With reference to the other organs no new facts were adduced; and the scantiness of our knowledge of the changes occurring in the rest of the body, and particularly in the organs of alimentation and in the cutaneous system, was rendered very evident.

"As to the much-debated question whether any, and if so what, alterations occur in the kidneys, two points were brought out: first, that the production of typical granular kidney was only indirectly due to alcohol through the medium of gout; and, secondly, that alcohol did frequently produce general hypertrophy of the kidneys,—a condition which has not previously been sufficiently insisted upon.

"The only other question which was generally discussed was what influence alcohol had upon the production of tuberculosis; and here the general consensus of opinion was that alcohol certainly was a factor of considerable importance in the production of this disease, and particularly of the pulmonary forms of it.

"In his reply, Payne summarized the results arrived at: 1. That the action of alcohol on the tissues is a toxic one, and similar to that produced by toxic agents generally, the analogy being very close indeed with the action of mineral poisons such as phosphorus, lead, and copper, and also with the specific poisons of diphtheria and beriberi. 2. That the organic changes produced by alcohol possess more importance than has hitherto been ascribed to them.

"The special merit of the discussion has probably been that it has focussed the existing knowledge of the subject, and what is, perhaps, of still more importance, has defined the directions in which further investigations should proceed, for it is only when we know definitely what are the changes produced throughout the whole body that we can draw sound general conclusions."

Among the questions considered before the International Congress, which met in Paris, July 19th to August 1st, was that of "The Relation of Alcoholism to Crime, and the Influence of the Number of Saloons upon the Consumption of Alcohol." The following conclusions and recommendations were the result: 1. The increase in the consumption of alcohol is one of the principal causes of crime, suicide, and insanity. 2. The reduction in the number of saloons having the effect to lessen the consumption of alcohol, the congress expresses its desire that the government take measures to limit the number of saloons.

Another question was that concerning the responsibility of inebriates. They recommend the incarceration of criminals of this class in special establishments, where they may be treated for alcoholism, and that a statistical record of the results be maintained. Further recommendations were made favoring the suppression of the falsification of alcoholic beverages, and insuring the least injurious forms for popular use. They favored a prohibition duty on alcohol, and the making of tea, coffee, and other temperance drinks free of duty. Among the statistics given are the following: In Belgium, from 1868 to 1882, the annual consumption of alcohol per head was from 7 to 9 litres (7 to 9 quarts). The number of insane increased 8240 to 10,020. In France the annual consumption of alcohol per head, 2.72 litres (3 quarts) from 1873 to 1887, 3.53 litres (4 quarts) from 1887 to 1882, and 3.83 litres (4 quarts) from 1883 to 1887. Crimes increased from 172,000 to 195,000, and the number of the insane from 37,000 in 1873 to 52,000 in 1885. In Italy the increase in consumption was from 2 to 7.5 litres (2 to 8 quarts) between 1872 and 1885; the number of criminals, from 1400 to 1500; of the insane, from 15,000 to 22,000. In Norway, on the contrary, the alcoholic consumption fell from 10 litres (10½ quarts) per head to 5 litres (5 quarts) between 1844 and 1871, and down to 4 litres (4 quarts) in 1876. Crime was reduced from 249 per 1000 inhabitants to 207 and 180, insanity diminishing in proportion.

According to a recent parliamentary report drawn up by the Prince Rubempré,[6 Dec.18] drunkenness is seizing with a terrible grip the working population of Belgium. Belgium is only surpassed by Bavaria in the consumption of beer, 240 litres (63 gallons) a year being credited to each inhabitant; while Russia and Denmark alone surpass Belgium in the consumption of spirit, the average in Belgium being 13 litres (13½ quarts) a year per inhabitant, or about 50 litres (52 quarts) a year per adult. Petithan stated at Liège, in 1886, that there were 100,000 persons in Belgium who drink half a litre (1 pint) of gin a day, and no less than 50,000 who drink a whole litre (1 quart). The number of public-houses is very large. Such infatuation seems scarcely credible in civilized countries.

Absinthe.—Laborde and Ollivier[211 Nov.3] deny the correctness of Cadéac and Meunier's conclusion that it is the anise in the absinthe, and not the absinthe itself, which is noxious. They conclude (1) that absinthe is, of all the essences in the liqueurs of that name, the most toxic and dangerous, and that it alone produces the epilepsy of the absinthe-drinkers; (2) that it is an error, scientifically and practically, to give the titles "beneficent" and "corrective" to absinthe essences; (3) absinthe liqueurs, and all liqueurs of the sort said to be aperient, and, above all, the non-purified and adulterated alcohols, constitute poisons the most prejudicial to health; (4) absinthism and alcoholism constitute the two great enemies to public health and the improvement of the human race.

MORPHINISM.

The literature of the year does not contain much that is new or important. There are three short papers by American writers, all opposed to the "immediate-withdrawal" treatment,—Wildman,[74, Feb.] Watson,[60, Mar. 23] and Smith.[207, Sept.] The latter writer condemns Levinstein's plan of treatment by immediate withdrawal in the strongest terms. He offers as a substitute what he says is a painless treatment; of this he assures his patient, who, placed in charged of a trained nurse, voluntarily surrenders himself. He avoids surveillance of detectives, regarding it as a revival of barbarism. The narcotic is at first reduced about one-third, the patient taking bromides instead, 1 to 3 drachms (4 to 12 grammes), until slight symptoms of bromism appear. Then the opiate may be reduced more rapidly and in a few days withdrawn altogether, but the usual abstinence symptoms do not develop except in a very mild form. Restlessness is best relieved by a hot bath, at 95° F. (35° C.), of fifteen to twenty minutes' duration, repeated, if necessary, every two to four hours. Nausea and vomiting is relieved by beef peptonoids and dilute phosphoric acid. For insomnia he resorts to another narcotic, cannabis indica, given boldly in ½-drachm (2 grammes) doses of Squibb's fluid extract, small doses inducing excitement. Electricity is used for neuralgia and other painful sensations. He sometimes uses cocaine in ¼-grain (0.16 gramme) doses combined with capsicum, but avoids hypnotics if possible. During convalescence, a tonic and supportive treatment is maintained. No statistics are given in support of this plan, nor does he tell us whether it is applicable to other than moderate and recent cases. Opposed to this is the testimony given before the

Société Médico-Psychologique, Paris, by Christian, who reports the cure of the morphine habit by immediate withdrawal in a patient taking 3 grammes (46 grains) of morphine and 1 gramme (15 grains) of cocaine a day. Ball, Ritti, Briand, le Grain, Ballet, and Rice, who discussed this subject, spoke in favor of immediate withdrawal. Schmitt[826 Sept.] recommends codeia as a substitute for morphia; after the latter has been reduced to a very small dose by progressive withdrawal, the codeia is then gradually reduced. He has also used meco-narceine for the same purpose. Stuart[2 Jan. 11] reports the cure of a patient who took 40 grains (2.6 grammes) of acetate of morphia a day by hypodermic injection. It was stopped at once, and hypodermic injections of $\frac{1}{100}$ grain (0.00065 gramme) each of digitalin and atropine were given; amyl nitrite was also used, and fluid nourishment with wine or whisky. The abstinence symptoms were very violent; muscular spasm, insomnia, dilated pupils, cold sweats, hurried respiration, and rapid pulse.

Birch, Calcutta,[3 Ap. 10] uses cannabis indica combined with strophanthus, to lessen the abstinence symptoms after the withdrawal of morphine. Chouppe[3 Feb.] has observed that persons addicted to morphine will tolerate doses of cocaine that would produce serious symptoms in those who are not taking morphine. He does not consider the one an antidote to the other, but thinks that the morphine renders the cortical cells less sensitive to cocaine. Laborde says that a small dose of cocaine combats the effects of morphine in the rabbit. Peck,[235 Jan.] writing from a mission in China, refers to the large consumption of opium antidotes used by the natives. While he condemns the misuse of these anti-opium pills, he gives his own formula for a pill of this character, which he uses at the mission, and sells to the natives at 50 cents per 100. They are made for him by Wyeth & Co., and labeled in Chinese, *Chi yeu ling hau.* The ingredients are: ℞ Sodii phosphate exsiccat., 1000 grains (65 grammes); abstract nux. vom., 650 grains (42 grammes); pulv. opii, 750 grains (48.6 grammes); triturate ipecac., 150 grains (9 grammes); abstract belladonna, 250 grains (16 grammes); piperine, 500 grains (32 grammes); ft. in pil. no. 1000. The pipe is forbidden, and the number of pills, commencing with from 2 to 8, is gradually reduced, the majority of smokers being able to leave off by the use of 100 pills or less.

Hart,[2 Mar.] inspector-general of customs, Pekin, reports that the legitimate Chinese imports of Maliva opium, the product of Central India, alone exceeds 2000 tons; how much more is smuggled is not known. The importation of Bengal opium has fallen off, but still amounts to about 1200 tons.

Fürst[8, Nos. 10, 11] discusses the use of opium during pregnancy, labor, and the period of suckling. While admitting its injurious effects on mother and child, in many cases and conditions, he considers that its dangers are in great part offset by its usefulness. He cautions against the rapid withdrawal of the drug during pregnancy in those addicted to morphine. Williams[144, Mar.] reports a recovery from morphine narcosis in a woman who took 25 grains (1.6 grammes) of sulphate of morphia. Six hours later, after emesis, strychnine and atropia were used hypodermically, faradism and amyl nitrite being also used, and the patient recovered in about twelve hours. Heavrin[53, May 4] reports a recovery after the injection of 1 drachm (3.9 grammes) of deodorized tincture of opium, in an infant 3 years old. Black coffee, hypodermic injection of atropia and the ice-towel, produce, he thinks, better effects than strychnia. Collins[59, Sept. 14] reports a case of opium-smoking and its disastrous effects. Gilles de la Tourette[94, July] reports the diminution in one case, and the cessation in another, of the hypodermic use of morphine in a patient after the partial relief of the lancinating pains by suspension. One had been using 1½ centigrammes (2$\frac{3}{10}$ grains) per day for two years. The other used 2 centigrammes (3 grains) from thirty to thirty-five times a day, and reduced, after twenty suspensions, to ten injections a day. Léteaud and Decoust[14, Aug. 21] called the attention of the International Medico-Legal Congress to the necessity of more stringent regulations of the sale of narcotics by wholesale and retail druggists. It resulted in the passage of the following resolutions: 1. Druggists and manufacturers of chemical and pharmaceutical products shall sell morphine and cocaine to pharmacists only, and must deliver it themselves. 2. The retail pharmacist shall not be permitted to fill a prescription containing morphine or cocaine but once, unless an order to the contrary has been written by the physician. A charmingly-written historical sketch on opium among the ancients is presented by Mendelsohn.[114, B. 16, H. 1, 2] "The Confessions of a Young Lady Laudanum-Drinker"[166, Jan.] exhibits such a volubility of style as to leave a doubt whether she has entirely given up the drug. Finally, may be mentioned Block's remarkable recommendation for incurable alcoholic subjects. He proposes to substitute the opium for the alcoholic habit on the ground that they will not make such beasts of themselves, or disturb their friends and the community to such a degree under opium as under alcohol.

THE COCAINE HABIT.

Magnan and Saury$^{164}_{\text{Feb.3; Mar.28}}$ reports 3 cases of chronic cocainism. The predominant symptoms in all were those relating to general sensibility, consisting chiefly of hallucinations producing a sensation as if foreign bodies were under the skin. The first, a merchant aged 48, was continually scraping his tongue, imagining that it was filled with small, black worms, and picking the skin to find cholera microbes. The second, a pharmacist, attempted to extract microbes from his skin with his nails and with a needle. The third, a physician, sought for crystals of cocaine under the skin. Hallucinations of cutaneous sensibility are first to develop; hallucinations of vision, hearing, taste, and smell occur later. Disturbances of ideation, as delirium, are consecutive to the hallucinations. The latter are less active than those produced by alcohol or absinthe. Epileptiform attacks occurred with two of the patients, and cramps in the third. Toxic epilepsies, when there is no predisposition, disappear with the cause. Saury's conclusions are that the cocaine delirium possesses the general characteristics of toxic insanities, but with certain special attributes. The delirium is essentially hallucinatory. Disturbed ideation is never primary, depending constantly upon sensory disturbances, illusions, and hallucinations. The special senses may be affected, but to an unequal degree. Disturbances of general sensibility acquire a marked predominance; next in order come hallucinations of vision, which may be very active; then hallucinations of hearing, and finally those dependent on odor and taste. The sensory disturbances are distressing, multiple, and changeable, as in alcoholism, but with less intensity, persistency, and variety. The phase of functional hyperexcitability which precedes their appearance may be properly compared to alcoholic intoxication. The phenomena of delirium accompanying these disorders are (1) of peripheral sensibility (analgesia, total or partial; inhibitory disturbances of vision and hearing) and (2) of motility (muscular hyperexcitability, convulsions, and epileptiform attacks). In the latter particular the effects of cocaine resemble those of absinthe. Heimann[69] reports the case of a male, aged 37, who took cocaine to break off the morphine habit. After taking 8 grammes (2 drachms) of cocaine daily for six months he exhibited the characteristic cocaine delirium, and three months later had an epileptiform attack. After attempts to withdraw the morphine and cocaine, he developed delusions of persecution of variable character, and finally had another epileptiform convulsion. Improvement followed withdrawal of the drugs under hospital management, but he returned to the cocaine habit later, and a renewal of the epileptiform symptom occurred, again followed by recovery after complete withdrawal, which lasted six months; then he resumed large doses of cocaine. His epileptiform convulsions returned, in one of which he died.

J. C. Da Costa[9] reports 4 cases of cocaine delirium following immediately upon urethral injections for the production of local anæsthesia. The quantities used were 30 minims (1.9 grammes) of a 4-per-cent. solution, 30 minims (1.9 grammes) of a 3-per-cent. solution, 10 minims (0.6 gramme) of a 4-per-cent. solution, and 20 minims (1.3 grammes) of a 6-per-cent. solution. The attacks were syncopal or epileptiform in character, followed by talkative delirium, with hallucinations and delusions. In all, the face was pale, the pupils dilated, the respirations hurried and irregular, and the pulse small and of high tension; in 2 cases rapid, in the others slow. Dercum suggested that the locality from which absorption took place might account for the violence of the effects. With ½-grain (0.03 gramme) doses subcutaneously he had not observed serious symptoms. Brush had used it in ½- to 1-grain (0.03 to 0.06 gramme) doses without other effects than the production of a talkative state and temporary laughter. Morgan[56] reports the case of a physician who acquired the cocaine habit through nasal applications of a 4-per-cent. solution, at first three times a day, later every few hours, and with stronger solutions (20 per cent.); finally, by insufflation of the powdered salt in amounts up to a drachm (3.9 grammes) a day. Under the latter doses, hallucinations and delusions of persecution appeared. A graphic description is given of his symptoms. He was finally cured by withdrawal of the drug, under seclusion. Lennox Browne[2] writes that none but those specially occupied in laryngology or ophthalmology can have an idea of the extent to which excessive indulgence in cocaine is carried. Concerning its injurious effects on the mucous membranes, he says that even its analgesic action is lost after long use, as shown in the diminished relief it affords in dysphagia from ulceration; an abnormal dryness of the throat is finally produced by its continuous use, and the reduction of capillary engorgement of the turbinated bones gives place to atrophy, anæmia, or increase in the chronicity of the hyperæmia. He has seen anosmia result in 2 cases, and its effect on the general health, producing a debilitated vasomotor system, is well known. Ingals[56 Oct.] is opposed to the sudden withdrawal of cocaine for the cure of the habit, preferring to diminish it gradually. Richardson[61 Sept.7], relates a marked erotic delirium in a modest married woman, after a nasal submucous injection of a few minims of a 10-per-cent. solution of cocaine. Luff[6 Sept.21] applied a 5-per-cent. solution of cocaine to the nasal mucous membrane with a brush, for nasal catarrh, and the patient continued it three years for its intoxicating effects. Indisposition for work or society, palpitation, constipation, dyspepsia, and general impairment of health resulted, but were promptly cured by cessation of the habit.

THE TOBACCO HABIT.

Von Giacich,[84 Aug.17] in an interesting editorial reviewing the tobacco question, reaches the conclusion that nothing very bad can be said against the moderate use of tobacco from a medical stand-point.

Bosworth,[59 Mar.23] in an article favorable to the use of tobacco, says: "As regards its effect on the diseases of the upper air-passages, in a practice of twenty years, largely devoted to the treatment of these affections, I can recall but exceedingly few cases wherein I have found it necessary to interdict the use of tobacco as affecting injuriously these passages, or as interfering with the success of treatment." He infers that the influence of tobacco upon the respiratory tract is chiefly through the indirect effect of the nicotine absorption upon the general nervous system, the ammonia and saline elements, in their direct effect upon the mucous membrane, being merely that of a feeble stimulant and irritant, which, however, may become prominent if long continued. He does not think we are justified in attributing a pharyngeal or nasal catarrh to the use of tobacco, though it may aggravate an existing catarrhal condition of the fauces. He prefers to view tobacco as "one of God's good gifts to man," and quotes Burton's opinion, written 300 years ago: "Tobacco—divine, rare, super-excellent tobacco,—which goes far beyond all their panaceas, potable gold and philosopher's stones. A sovereign remedy to all diseases. A good vomit, I confess; a virtuous herb if well qualified, opportunely taken, medicinally used; but as it is commonly abused by most men, who take it as tinkers do ale, 'tis a plague, a mischief, a violent purger of goods, lands, and health. Hellish, devilish, and damned tobacco,—the ruin and overthrow of body and soul."

Kitchen's article$^{59}_{\text{Apr. 27}}$ may be regarded as an answer to the above, as he entitles it: "On the Health-value to Man of the So-called Divinely Beneficent Gift, Tobacco." It is a general article in which are reiterated the usual arguments against the use of tobacco, some of which are very strongly put. He says that the stimulating and narcotic properties of tobacco have an effect upon the body in moderate use as well as in immoderate use, the effect being simply in proportion to the quantity used, though the effects of moderate use may not be measurable by ordinary means. It is easy to see the effects of large amounts of tobacco in the stunted growth of adolescents, in functional cardiac disorders, in intellectual sluggishness, loss of memory, color-blindness, loss of appetite, neuroses of motion, marked blunting of various functions of sensation, and in degeneracy of descendants; but that lesser evils are produced must be proved mostly by inference, circumstantial collateral evidence, and analogy. He refers to the economic side of the question, showing that the people of our country spend annually over seven hundred millions of dollars for tobacco,—20 per cent. more than is spent for bread; yet this represents but a minor part of the cost of the tobacco habit to the country.

Shiels$^{77}_{\text{Apr., May}}$ collected a number of opinions on the tobacco question by sending a list of questions to the members of the New York Academy of Medicine. He received answers from 113 members. Some of the questions and answers are as follow: "What, in your opinion, constitutes the tobacco heart?" All who answered seemed to exclude organic lesions, regarding it as a functional derangement characterized by irregularity, irritability, palpitation, and intermission. Some mentioned uneasiness and pain. "Have you ever seen it lead to hypertrophy or valvular disease, or both?" The general negative tendency of all the answers shows that, though organic changes may result from tobacco heart, their occurrence must be rare and not much observed. "Do you find tobacco heart of common occurrence?" The answers being chiefly in the negative, compared with the number of tobacco-users the condition must be rare. "Which are more liable to it, smokers of pipes, cigars, or cigarettes?" Cigarettes were mentioned as the most frequent cause.

The author himself thinks the Turkish pipe the least injurious, next in order being the long-stemmed, porous, clay pipe, frequently changed; next the briar-root pipe, the cigar, and lastly the cigarette,—a consequence of the prevalence of inhalation and of more continuous smoking. The replies as to whether tobacco increases or lessens mental activity were contradictory, and most of the answers were negative as to whether it causes insomnia or permanent brain diseases; but all admitted that it caused tremulous hands. "Is pharyngitis more common in smokers than in others?" was answered in such a way as to lead the author to the opinion that pharyngeal irritation is a common condition among smokers; also, respecting digestion, that if moderately used it may act as an aid, but that in excess it may cause dyspepsia. The greater number seemed to look upon the moderate use of tobacco as fraught with neither good nor evil. His own opinion is that tobacco is a mild narcotic, which the average adult quickly tolerates, and which, taking into consideration its almost universal employment and the general health of those using it, cannot be looked upon as harmful; that, excluding youth and idiosyncrasy, when used in moderation at times when the stomach is not empty, tobacco has a beneficial effect. He regards its use in any form by the young as harmful in the extreme, and says that no youth under seventeen should be allowed to indulge in tobacco, and that it would be better to place the age at twenty or twenty-one.

Robert[142, May 30] reports from Algeria a series of cases showing the latent effect of tobacco through the appearance of various disturbances (chiefly cardiac) after many years of apparent tolerance, with relief after cessation of the habit. He concludes that they resist the effect up to a certain age, when cardiac enfeeblement and arterial sclerosis develop, exhibited by disturbed cardiac and vascular functions demanding the absolute suppression of tobacco.

Dumas$^{142}_{\text{Nov 30,'88}}$ also reports a series of cases from Algeria on the noxious effects of tobacco, among which is a case of angina pectoris, ascribed to excessive cigarette-smoking, which resulted fatally. Another, a case of chronic gastro-enteritis, ascribed to the excessive use of cigars, terminated fatally after an acute attack. Another patient, affected with attacks of cardiac failure of a grave character, was cured by abandoning his pipe, which had been used excessively.

Huchard's lectures$^{14}_{\text{May 22,'88}}$ upon the effects of tobacco, which will form part of a treatise on diseases of the heart, are the most important contributions of the year. He reviews the chemistry and physiological action of tobacco, showing its effects on the nerve-centres, the pneumogastric nerves, the vascular system, and on muscular tissue. He considers the chief action to be upon the medulla oblongata. He describes what is termed the "irritable heart of smokers," in which there may be acceleration or slowing of the pulse, intermittence and arythmia of the heart, lipothymia and syncope, angina, præcordial anxiety, palpitation (tumultuous beating), sudden and distressing arrests of the heart, and extreme irritability of the circulatory functions. This action of tobacco is usually ascribed to its effect on the nervous system in general and the pneumogastric in particular; but this is not all: much is due to its action on the muscular system in general and particularly upon the vascular walls. Tobacco is not simply a cardiac poison: it is also an arterial poison. The vaso-constrictive action of nicotine has been thoroughly demonstrated. The effects of tobacco resemble absolutely those produced by galvanization of the great sympathetic; it is probably through the nerves that nicotine acts upon the vessels. This tetanizing process produces, in reality, a muscular ischæmia, which explains in part the tremor, muscular weakness, and paresis observed in nicotinized animals. This vaso-constrictive action produces disturbances in various organs. The nerve-centres show signs of ischæmia: cerebro-spinal irritation, headaches, with vomiting (false migraine from tobacco), morning fatigue, impairment of memory, psychical irritation, inaptitude for work, and even transitory aphasia, with incomplete hemiplegia alternating from right to left. The respiratory apparatus, besides serious attacks of dyspnœa produced by the action of tobacco on the medulla and respiratory muscles, may exhibit disturbances attributable to contraction of the pulmonary vessels. The diuretic effect of tobacco is also explained by this hyperarterial tension. But it is upon the heart itself that the most deplorable effects of this vascular tetanization are produced. Certain attacks of angina and disturbances of rhythm may be ascribed to spasm of the coronary arteries and consequent ischæmia. The hard, small, tobacco pulse is also explained by this vaso-constrictive action. At first these troubles are functional, but in time, from repetition or permanence of these vascular contractures, a sort of peripheral circulatory barrier is set up. Arterial tension is increased, the heart suffers from successive dilatations, which in turn become permanent, and there is produced, finally, a general arterio-sclerosis which, if it involves the heart-muscle, may produce various degenerations, of which dystrophic sclerosis is the most common. We may have two or three different forms of angina pectoris from tobacco: 1. *Functional angina*, relatively benign, resulting from a spasmodic state of the coronary arteries, and without a myocardiac lesion. This is the *tobacco spasm.* It is rapidly cured by the discontinuance of the tobacco habit. 2. *Organic angina*, of serious character, resulting from coronary sclerosis,—the *tobacco sclerosis.* It is not curable. 3. A gastric form, which is the most benign of all, a functional angina resulting from frequent disturbances of digestion produced by tobacco, such as gastralgia, dilatation of the stomach, etc. The following table exhibits the characteristics of the two principal forms:—

True Angina Pectoris. (From Coronary Arterio-Sclerosis.)	*Spasmodic Angina from Tobacco.* (From Coronary Arterio-Spasm.)
Anatomical cause: Aortitis, sclerosis, and stenosis of the coronary arteries.	Anatomical cause: Spasmodic state of the coronary arteries.
Symptoms: Accession of angina, unassociated with other accidents.	Symptoms: Accession of angina, associated with other signs of tobacco intoxication; vertigo, gastric and respiratory disturbances.
Anginal attack frequently occurs, without other cardiac disturbance, and is of short duration.	Anginal attack may be accompanied by functional cardiac disturbances; slowing of beats, intermittence, arythmic palpitations, lipothymes, etc. Attacks may be of long duration.
Attacks rarely spontaneous, most often provoked.	Attacks rarely provoked, more frequently spontaneous.
Prognosis: Slow disappearance of attacks under treatment.	Prognosis: Rapid disappearance of attacks under suppression of the cause (tobacco).
Death very frequent.	Death is rare.

Nitrite of amyl is recommended to be used during the attacks and nitro-glycerin in the interval, in both forms, to relieve the vaso-constriction.

Benson[196, June] gives a concise summary of the chemistry of tobacco and its effects on the human system.

Wilkinson[90, Mar.] reports a case of tobacco poisoning in a woman, who injected per rectum a pint (½ litre) of tobacco infusion made from ½ ounce (15.5 grammes) of tobacco. There was vomiting, cardiac and respiratory failure, and loss of vision, with dilated pupils. She recovered, after the subcutaneous injection of ½ drachm of ether (1.9 grammes), drop doses of wine of ipecac and brandy and ammonia by the mouth.

Broomhead[90, Mar.] records the death of a boy, aged 13, following nausea and vomiting after cigarette-smoking, terminating in convulsions and subsequent respiratory failure. Ether injections were given with but transient effect. Death is attributed directly or indirectly to tobacco poisoning, but a cardiac hypertrophy and valvular lesion were found at the autopsy.

Rochs[13, June] concludes, after investigating the effects of tobacco on tobacco-workers, that working in tobacco-factories, provided they are properly ventilated, produces no disturbances of health worth mentioning, but when the air-space is too limited, chronic bronchitis, digestive disturbances, and affections of the nervous system develop. Anæmic women and those who are pregnant suffer from disturbances of the genital functions.

Tucker,[59, Sept. 14] analyst to the State Board of Health, in his report on cigarettes, says that careful analysis of tobacco and paper failed to reveal other injurious substances than the tobacco itself, the evils of cigarette-smoking being due, he thinks, to their cheapness enabling excessive quantities to be used both by children and immature persons, who usually inhale the smoke.

A novel method of cure is suggested[77, Nov.] to tobacco-users and whisky-drinkers. It consists in postponing the accustomed morning smoke or drink ten minutes later each day until the entire day is passed without indulging.

A. G. Auld, of Glasgow,[6, Apr. 30] thinks that tobacco is responsible for a variety of functional derangements which there is no reason to aver cannot terminate in organic disease. He is convinced that the slightest trace of albumen in the urine is pathological, and that it is frequently induced by preventable causes, and one of these is chronic poisoning by nicotine. He thinks he has certainly traced the disorder in a few cases entirely, and in others partially, to the habit in question. Another derangement consists in localized fibrillary twitchings, something similar to what is observed in progressive muscular atrophy, and perfectly distinct from tremor. The twitchings are often excessive, and occur most frequently about the trunk and upper arms.

LEGAL MEDICINE AND TOXICOLOGY.

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MEDICAL EXPERT TESTIMONY.

Among the many subjects which were discussed by the International Medico-Legal Congress at Paris, last August, the relation of medical experts to criminal prosecutions had a prominent place. A report was made by Messieurs Demange and Guillot, representatives of the French judiciary, and the series of propositions which they formulated as the result of their consideration of the matter gave direction to the deliberations of the well-known men who took part in the debate. The following were adopted as expressing the views of the convention[3, Sept.1]:—

1. To protect at once the interests of society and of persons accused of crime there should be employed in every medico-legal investigation two experts at the least. They should be named by a magistrate, should have equal privileges, take the same oath, render a single report signed in common, and receive the same pay from the State. 2. Except in cases requiring special skill, experts should be chosen from official lists prepared by authority upon the nomination of scientific bodies designated for the purpose. 3. The system of a plurality of experts requires the establishment, at the medical schools, of a supreme council of legal medicine, whose duty it should be to determine such disputed questions as shall be referred to it. 4. The magistrate should be present at the autopsy and other examinations, in case of violent death, in order that he may furnish to the experts certain information which will be useful in elucidating the inquiry into the cause and manner of the death. 5. Counsel for the accused may also be present at the autopsy to check the expert from the point of view of the defense. 6. Schools of law should include in their curriculum of study the general principles of legal medicine. 7. Medico-legal autopsies, except in cases expressly forbidden by the judge, should be open

to students of law and medicine, in order to promote the study of legal medicine. 8. It is recommended that in connection with courses of study in legal medicine or in record offices, where they can be available, collections be made of medico-legal reports and of articles which have been used in evidence, to be under the control of magistrates and experts.

Ward,[59 Feb.] in his address as President of the New York State Medical Society, reaches conclusions concerning medical experts not unlike those above quoted. They are as follow: "In most cases where medical expert evidence is required, at least two physicians are called to the stand, and in many cases a half dozen. The remedy which I would suggest would be that, under such circumstances, a board of three experts should be appointed by the court—one on the suggestion of the counsel for the defense, one nominated by the counsel for the prosecution, and a third by the court itself. These experts should be paid by the court and the charge divided equally between the two sides. To this board of experts should be submitted in writing the questions involving medical matters. The answers should be submitted in writing, and sworn to; and medical witnesses (experts) should not be required to go upon the stand. In the event of the failure of the board to entirely agree, a minority report might be admitted, and, if each side desired to be represented by two or three experts instead of a single one, there would be no objection to such a course. The adoption of this course would certainly result in obtaining from medical experts opinions free from the bias which arises from the expectation of pecuniary reward from either side, the unseemly antagonisms between the expert on the stand and the cross-examining counsel would be avoided, and the ends of justice would more speedily and surely be attained."

Judge Bartlett, of the Supreme Court of New York, in an address before the Society of Medical Jurisprudence, presented a legal view of the proper use of medical experts.[157 May] He was of the opinion that physicians ought not to act at once as medical experts and medical advocates or advisers, and that, if acting in one capacity, they should avoid the other. If asked to appear as a witness in an action of tort, the physician should carefully abstain from seeing the injured person or examining into the circumstances of the injury upon any agreement or understanding that his right to compensation for so doing depended on the conclusion which he reached; if this were his invariable practice, he would always be prepared to sustain the severest cross-examination, and if the fact were brought out in the course of this examination that the party by whom he was called paid him, or agreed to pay him, no matter what view he might take, this bit of evidence would add greatly to the weight of his other testimony with the jury. The practice of some corporations, of employing surgeons on a salary to investigate cases of injury and to testify as experts in case of litigation, is an objectionable one, and discredits the testimony of such partisan witnesses. Each trial should have its medical witnesses specially employed for that occasion only. Sir Fitz James Stephen's suggestion, that the medical witnesses on both sides should meet in consultation and openly discuss and exchange views of the medico-legal features of the case to be tried, is commended as a salutary check upon partisanship. The proposition that experts should occupy a judicial or quasi-judicial position in the administration of justice, instead of acting merely as witnesses, is regarded by Judge Bartlett with disfavor; as a matter of fact, an expert witness, of whose fairness and impartiality both parties are convinced, will often speak with an impartiality which is almost judicial. In a number of cases, where questions of insanity have arisen upon habeas corpus proceedings, and the judge, at the request of all persons interested, has himself chosen and designated some medical man of high standing and acknowledged attainments to examine into the mental condition of the petitioner, the conclusion has been acquiesced in, not only without dissent, but often with expressions of positive satisfaction from all the parties concerned in the inquiry.

CONCUSSION OF THE SPINE IN ITS MEDICO-LEGAL ASPECTS.

H. H. Smith,[9 June 30] introduced a discussion of this subject at the last meeting of the American Medical Association by a conservative paper, of which the following is an abstract:—

In all cases of alleged injury of the spine producing compression or concussion, frauds are always to be suspected, since statistics show that three-fourths of such cases have been found to be of that character. The neuropathic disturbances which frequently follow injuries may be due to a neurotic condition of the patient, inherited or acquired; in the latter case, it is frequently a result of sexual excesses. Charcot pronounces these disturbances hysteria. The speaker believed that real spinal concussion from injury was exceedingly rare. The force required to cause serious injury to the spinal cord is greater than is generally supposed. It is, when genuine, always rapidly followed by muscle-wasting. Its development is prompt—a few hours or days after the injury, and not weeks after, when the mind has had time to brood upon it.

Illustrative of the prompt development of symptoms in cases of injury of the cord, several instances were reported with the results of autopsy and microscopic examination. The following conclusions were expressed: 1. Concussion of the spine is no longer a matter of doubt, but may sometimes occur from various forms of violence, there being nothing peculiar in the application of the force to the body, as the result of derailment or collision of railroad trains. 2. The pathological changes noted in the molecular structure of the cord as the result of shaking, jarring, or so-called concussion of the cord, when attended by paralytic symptoms, may be due to hæmorrhagic effusion or be shown post-mortem in softening or localized or limited atrophy. In cases due to hæmorrhage, the symptoms may be improved by judicious treatment and permanent disability prevented. 3. The possibility of pre-existing neurasthenia, or hysteria, or fraud on the part of a claimant, should be carefully noted in forming a diagnosis in these cases. 4. As the question of permanent disability justifying exemplary damages is frequently raised in claims of the kind alluded to, it should be recollected in forming a prognosis that numerous cases are reported of recovery, or marked improvement in a few weeks, and one in three years, even after the occurrence of paralysis. 5. No physician should go into court and swear that a plaintiff has had a concussion of the spinal cord or of its nerves unless he has proved the disturbance of the normal functions of the cord, as shown in sensation or motion, or both, and that the symptoms appeared soon after the injury.

THE FATALITY OF CARDIAC INJURIES.

Hare $^{19}_{\text{June 22; Aug. 10}}$ has made some original investigations which have an important bearing on the question of the prognosis of wounds of the heart. After a preliminary review of the recorded cases of more or less prolonged survival after various lesions affecting the heart and pericardium, he relates in detail some experiments made by him on ten dogs; having first fully anæsthetized them, he forced various kinds of puncturing instruments into the heart and studied the results of the wounding.

The first dog was stabbed with a long steel hat-pin, the motion which was given to the head of the pin by the cardiac impulse showing conclusively that the heart had been entered. The animal showed no sign of discomfort from this operation, and was in perfect condition seventeen days after it. A second dog was stabbed in a similar manner; the primary effects were negative. Forty minutes after the wounding the dog was killed, and the autopsy showed a puncture of the right ventricle and about an ounce (29.5 cubic centimetres) of blood in the pericardium. In the third experiment, the heart of a dog was punctured with an aspirating needle; some pain followed, but the next day the animal appeared quite well. He was now killed, and the autopsy demonstrated a perforating wound passing through the left ventricle. In the fourth case an aspirating needle was used, and its entry into the heart was demonstrated by the spurting of blood from the open end of its canal. The dog continued well for three days, when he was killed and examined; the right auricle was found to have been punctured. The fifth dog was stabbed twice with a small pair of dissecting scissors; after each puncture the cardiac impulse was small and apparently embarrassed. The dog was killed an hour after the stabbing, and the right ventricle was found wounded; the pericardium contained a small clot. In the sixth experiment, a puppy was stabbed with the scissors; some blood escaped on their withdrawal. The animal did not suffer during the next three days; it was then killed. The autopsy found blood in both pleural cavities and in the pericardium. The wound in the heart was covered with a fibrinous clot. The right ventricle had been punctured. A large dog was stabbed twice with the scalpel in the seventh experiment. The immediate effect was shock. The animal was found dead fifteen hours after the wounding. A large clot covered the pericardium, hiding the heart, and there were four ounces of bloody serum in the pleural cavity. There were two penetrating wounds of the left ventricle, one of them having divided the columnæ carneæ. In the eighth experiment a dog was stabbed with a scalpel driven twice into the fourth interspace. Three minutes later the animal gasped a few times and was dead. The pericardium was found filled with blood, a clot of nearly 2 pounds (1 kilogramme) having displaced the heart. The right ventricle was wounded. The rapid and profuse hæmorrhage had determined the early result. The next dog received a knife-thrust in the fifth interspace, directed toward the spine. No symptom followed. Next day the dog was killed; the left ventricle was found wounded, but not opened; there was a clot in the wound and a little blood in the pericardium. The tenth experiment consisted of a punctured wound in the fifth interspace, a scalpel being the weapon. Two hours later the animal seemed almost perfectly well, although there had been evident syncope immediately after the wounding. Forty-eight hours later the dog was killed; there were 4 ounces (118 cubic centimetres) of clot in the pleural cavity and 2 drachms (7 cubic centimetres) of liquid blood in the pericardium. There was a widely-gaping, penetrating wound in the left ventricle near the apex, so deep as to reach, but not to perforate, the posterior wall of the cavity; the wound in the anterior wall was sealed with a firm, partly-decolorized clot which rendered the orifice water-tight.

The writer draws the following conclusions from his experiments:—

1. There are three ways in which death may occur in cases of heart-wounds: (*a*) By hæmorrhage from the cardiac cavities; (*b*) by hæmorrhage from the heart-muscle itself; and (*c*) by injury to the centre which Kronecker and Schmerz have localized in the dog's heart,—a spot above the lower limit of the upper third of the ventricular septum, which, when it is injured, brings the heart to a stand-still. This is the so-called co-ordinating centre. 2. The lethal result of a heart-wound depends largely upon the rapidity with which a hæmostatic clot is formed in the opening. 3. Heart-wounds heal by the formation of hæmorrhagic exudate, which plugs the leaking opening and permits repair. 4. Most important of all, we learn that cardiac wounds, however severe, are not necessarily fatal, simply because they are heart-wounds. There are other causes which may bring about a fatal effect, chief among which are pericarditis, cardiac myositis, and endocarditis; while a sequence even more rapid in its onset may be embolism,

or heart-clot. These are secondary questions which do not form part of the subject in hand.

IDENTIFICATION OF HUMAN HAIRS.

Laurenz Schmitz$^{311\ 126}_{B.40;\ July}$ was charged with the duty of determining the origin of three hairs found upon the head of a hammer in the house of an old man of 75 years who had been murdered. The magistrate assumed that they might have come from the head of the victim, and so that they might help in identifying the weapon used. A lock of the dead man's hair was also submitted to the expert for purposes of comparison.

Examination led to the conclusion that the three hairs did not come from the head of the murdered man, that two of them certainly, and the third probably, came from a cat. Examined with the naked eye, the suspected hairs were much too short and too small for human hairs; their color was mottled, with abrupt transitions from black to white, while a whitened human hair is progressively white from the root outward. Human hairs have a bright, silvery lustre never seen in fur. In curling, the former take long waves or twists; the latter has short ones. Microscopically, the following characters were noted: In the three short hairs the diameter of the medullary cavity was much greater than that found in the man's hairs; this cavity nearly filled the entire shaft in the one case, but was only one-sixth the diameter of the other; and, in the latter, a cortex was plainly visible. Moreover, the cellular scales of the outer layer were easily made out throughout the length of the human hair, and had a distinctive form; but these cells were scarcely to be differentiated in the suspected hairs.

Numerous measurements made by Schmitz led him to the conclusion that when the diameter of the medullary cavity exceeds a quarter of the diameter of the shaft of the hair, it may be set down as establishing it as of animal origin; but the converse of this is not true, since it sometimes happens that individual hairs from the dog, the horse, the cow, and the goat have a small cavity, and resemble human hairs. Cats' hairs have a peculiar arrangement of the cells in the medullary cavity and of the epithelium on the surface; the latter give to the hair the appearance of certain kinds of plants. Near the free extremity the medullary cells begin to take on the form of minute cells filled with air; they have well defined outlines, and are disposed in series; as one approaches the bulb of the hair, these cells increase in size without projecting farther into the medulla, but soon they fill nearly the whole cavity with a gradual lessening of their size near the bulb.

SEXUAL PRECOCITY.

Douglas,[1 Oct.19] of Nashville, Tenn., reports a case of extraordinary sexual precocity in a boy. The boy was 4¼ years old, 3 feet 10½ inches in height, and weighing 54 pounds (24.6 kilogrammes). The features were rather large and coarse. The general muscular development was mature. The penis and scrotum and testes were those of an adult, the penis measuring full 3 inches (7.5 centimetres) in the flaccid state; the prepuce rested half retracted over the glans. The pubes was covered with hair. The abdomen was quite protuberant. Mentally, the child was sluggish, and he was obstinate and self-willed; he played with other children, but did not appear to have any special fondness for the opposite sex; he was addicted to masturbation, taking advantage of every opportunity to practice self-abuse. His erections were vigorous; the emissions found on his clothing contained mucus, but no spermatozoa. Change in his manner and development had followed a prolonged chilling of the body by wading in a creek. He began masturbating at the age of 3 years and 9 months. His father died of tuberculosis.

Jagoe, of Mississippi, relates a case which will serve as a companion-piece to the one above quoted. His patient was a negro girl, born in October, 1885. In July, 1887, she began menstruating regularly, the discharge at first being mucous, and a little later sanguineous. Her breasts were fully developed, and her pubes had a full growth of hair. Her parents were living and in good health. This child was the tenth in a family of twelve.

POST-MORTEM PHENOMENA.

B. W. Richardson[38 1st Q.] contributes a well-considered article on the absolute proofs of death. First reviewing the circumstances usually calling for a decision of the question of apparent death, such as persistence of a florid color in the face, retention of warmth, muscular movements, maintenance of life-like expression, delay in the advent of putrefactive changes, suspended animation under prolonged narcotism, cataleptic trance, he then considered the value of the various reputed proofs of death. The cessation of the respiratory function is not by any means reliable, in the author's view, as a test. It is quite certain that in poisoning by chloral, and in catalepsy, there may be life when no external movement of the chest is appreciable and the respiratory murmur cannot be detected. The test with the mirror before the mouth is deceptive, a deposit of moisture on the glass being possible as the result of passive exhalation when life is quite extinct.

Equal doubt attends the absence of arterial impulse and the heart-sounds; he is quite sure, he declares, that the pulse, as well as the movements and sounds of the heart, may be undetectable at a time when the body is not only alive but actually recoverable. Of much greater value as a proof of death is the absence of any response to the venous turgescence test; this is applied by placing a bit of mill-board on the forepart of the wrist so as to prevent pressure on the ulnar and radial arteries, then a fillet is tied firmly around the wrist so as to compress the veins of the back of the hand; if upon this the veins, after a time, fail to enlarge, there is *prima facie* evidence that no circulation is going on and that life is extinct. This test is the one least likely to deceive. Reduction of the body temperature to 80° F. (26.7° C.) or less, the development of rigor mortis, the coagulation of blood in the veins, and the advent of putrefaction are ample evidences of death. Secondary importance is attached to the red tint of the fingers held before a strong light. The presence of muscular contractability under electrical stimulus has a certain value as indicative of life, although its absence would not be evidence of death. The behavior of the skin and subcutaneous tissues when a hypodermic injection of ammonia is made is of importance, and deserves a prominent place among the proofs of death. If the part receiving the ammonia still has a circulation of blood within it, it will show a blotch of a red, erythematous color, with raised spots mottling the surface; if death has actually occurred there will be a dirty stain without a trace of red spots.

One practical suggestion is made that is well worth remembering,—if the application of the tests mentioned leaves any doubt, or even if they leave no doubt, the body should be kept in a room the temperature of which has been raised to 84° F. (28.9° C.)

with moisture diffused through the air, and in this warm and moist atmosphere it should remain until distinct signs of decomposition are observed.

Brouardel$^{100}_{\text{May 28, June 6}}$ declares that a pathognomonic sign of death does not exist, but, although single signs may be unreliable, they become of value in connection with others. The immobility of the features is characteristic. The fact that the eyes remain open persistently at death has been regarded as a valuable sign; sometimes there is external strabismus and wide dilatation of the pupil at the supreme moment. After death by certain wounds, involving the spinal cord or medulla oblongata, cadaveric spasm develops in a high degree. Relaxation of the sphincters is a common phenomenon soon after death. Scarification is not a convincing test; hysterical subjects may be pricked without the appearance of blood. The injection of a drop of ether into the nostril will be apt to procure a response if there is life. Observations on the respiration are of uncertain value, since in cases of apparent death the breathing is suspended. The most certain signs are drawn from the circulation, and the development of cadaveric lividities, due to paralysis of the capillaries, is an excellent sign drawn from this source. A temperature of the body of 68° F. (20° C.) is incompatible with life. Finally, if the finger of the subject is brought within half an inch of a candle-flame, a blister slowly forms, and at length suddenly bursts with a slight explosion, in consequence of sudden expansion of the gaseous contents.

Catherine Schipiloff$^{197}_{\text{Aug. to Oct.}}$ has reported an elaborate series of original observations, having for their object the determination of the nature and causes of cadaveric rigidity. These researches present new proofs of the validity of Kühne's theory that post-mortem rigidity is due to the coagulation or precipitation of myosine under the influence of an acid product developed in the muscles, together with the participation of a fibrino-plastic ferment. Two other phenomena were found to be coincident with cadaveric rigidity, and to promote its development; one of these was the physiological contraction of the muscle, and the other its shrinking and shortening, due probably to the muscular elasticity, thus determining the stiffness of the muscles after death.

Mackenzie$^{206}_{\text{June}}$ reports some interesting original observations on the recently-dead body; these investigations illustrate the influence of a tropical climate in modifying the usual changes which dead bodies undergo between death and decomposition, all the observations having been made during the midsummer season in Calcutta; the temperature during the period selected ranged from 92° F. to 79° F. (33.30° C. to 26.1° C.), and the average was 85.5° F. (29.7° C.). Thirty-six bodies were the subjects observed.

Muscular irritability continued through an average period of one hour and fifty-one minutes; its longest duration was four and a half hours, and its shortest was half an hour. The latest period of commencement of post-mortem rigidity was seven hours, the earliest was forty minutes. The average time of beginning was one hour and fifty-six minutes. The period of longest duration of rigidity was forty hours; the shortest period was three hours; the average was nineteen hours and twelve minutes. In the majority of the cases it appeared and disappeared in the following order: Muscles of the neck and lower jaw, muscles of the back, muscles of the upper extremities, muscles of the lower extremities. Cadaveric lividity appeared after an average period of fourteen hours and thirty-three minutes; its earliest appearance was in one hour and thirty-eight minutes; its latest development was after thirty-one hours and thirty minutes. The green discoloration of putrefaction appeared at the latest in forty-one and a half hours; at the earliest in seven hours and ten minutes. Larvæ were observed after an average period of twenty-six hours; the earliest period was three hours and twenty minutes, and the latest was forty-one hours and thirty minutes. Blebs appeared on the surface after an average of forty-nine hours and thirty-four minutes; seventy-two hours at the latest and thirty-five hours at the earliest.

Another series of observations, made in October of the same year, during cooler and dry weather, gave results not greatly different from those above quoted. In both periods, however, the results were in contrast with the observations published by Casper, Devergie, Taylor, and other authorities. Mackenzie found that muscular contractibility persisted a shorter time in Calcutta dead bodies than in those dying in Europe; that rigor mortis began earlier and disappeared sooner; that lividity developed later; and that green discoloration and blebs appeared later.

Cones$^{6}_{\text{May 25}}$ reports a case of post-mortem sweating which he regards as unique. A man aged 42 had been suffering for more than nine months from albuminuria, without any casts in his urine, and without œdema or ascites. Ten days before his death he was suddenly seized with uræmic coma and left hemiplegia, which persisted to the end of his life. The temperature of his body during the last days of his life ranged between 102° (38.9° C.) and 104° F. (40° C.); six hours before death it steadily sank. All treatment to produce diaphoresis had been fruitless, and the skin, though not absolutely dry, showed no sweating, even after repeated hypodermic injections of pilocarpine, the last injection, $\frac{1}{3}$ of a grain (0.021 gramme), having been given three days before the death. This gave rise to only slight perspiration, but produced an excessive bronchial secretion. Forty-eight hours before the death, however, the patient perspired profusely, and this continued uninterruptedly to the end, even when the surface temperature was subnormal. The body was laid out in the usual manner, nothing noteworthy being noticed in its condition. When it was inspected, sixteen hours later, the sheets and pillows on which it lay were saturated with sweat and the skin felt moist. This continued during the next eight hours, and then gradually subsided; forty-six hours after death it had wholly ceased.

The explanation offered by Mr. Cones for this phenomenon is as follows: The patient was sweating freely up to the time of his death; the glands and lymph-spaces adjacent to them may be supposed to have been fully charged with fluid at this time, and when rigor mortis set in they were mechanically emptied of their contents.

As to the medico-legal bearings of this case, the writer states that a question might readily arise concerning the time of the death on a discovery of a body, the circumstances of whose dying were unknown. In the present instance, the appearances presented by the body were those of a very recent death, and a stranger to the facts might readily have been misled. The case suggests, also, that sweating should not be regarded as a purely vital phenomenon,—a proof that a person is apparently not really dead.

THE PROOFS OF LIVING BIRTH.

The hydrostatic test for determining whether a child was born alive or was still-born is generally admitted to be open to some doubt. Zaleski$^{158}_{a.11,a.1}$ suggests a new test, which is based on the following principles: In the first place, the lungs of the fœtus contain as much blood as is necessary for the nutrition of the pulmonary tissue, while the lesser circulation, which is inaugurated at the birth, results in a large increase of the blood passing through the lungs. In the second place, the blood contains a constituent whose percentage is almost unalterable, and which is readily estimated quantitatively; this element is iron. Therefore, a lung in which the act of respiration has taken place will contain considerably more iron than one in which there has been no respiration. Zaleski, therefore, believes that from the amount of iron found in the lungs it may be determined whether the child was born alive or dead. He has estimated the amount of iron in seven cases. Four of these were unmistakably still-births; 3 were cases of children as surely born alive. In the former the total amount of solids was 33.22 per cent.; and of these, in the fresh state, iron was represented by .0110; in the dry state, it was .0828. Of the 3 cases born alive the average solids were represented by 15.87, with .0188 per cent. of iron in the fresh state and .1182 per cent. in the dry state. In these instances the application of the hydrostatic test was very contradictory; one case, which was undoubtedly still-born, gave a positive answer; another, which was certainly born alive, gave a negative result.

From his studies, Zaleski believes that he is warranted in drawing the following conclusions: 1. The percentage of solids, as well as the percentage of iron, is considerably less in the lungs of children which have not breathed than in the lungs of children born alive. 2. The difference is especially evident on comparing the amount of solids with the amount of iron in each individual case. 3. Even in the comparison of averages the difference is very perceptible. 4. The amount of the iron in the lung-tissue increases with the age of the fœtus or the child. 5. Diseased conditions of the lungs do not impair the test. 6. The infiltration of the pulmonary tissues with blood does not appear to influence the test. 7. This test has never been found to be contradicted by other tests. 8. The amount of iron in the lungs has invariably been found to be dependent on the respiration, and it increases in direct proportion to the functional activity of the lungs.

From a theoretical point of view the following objections may be made to this method: 1. The process requires a special education and the ability to make a chemical analysis. This objection may be met, however, by the fact that all the examiner is required to do is to ligate the roots of the lungs, when they may be subjected to the hydrostatic test, and then transmitted to a chemist for analysis. 2. The difference in the amounts of iron discovered is so small that an error may readily be introduced; in this connection, however, it is only necessary to remember that the differences are too great to fall within a probable error in a proper chemical examination. 3. The amount of iron may vary in different individuals, since the quantity of this element in the liver and the spleen is known to be subject to sudden variations. This objection may be met by the fact that the liver and spleen are blood-making organs, and therefore the percentage of iron in them may be subject to variation. This is not the case with the lungs. Finally, it must be admitted that further investigation is required before it can be positively stated that various pathological conditions, either of the mother or of the child, will have no influence on the amount of iron in the lungs, such as anæmia, leucocythæmia, or morbus Werlhoffii, where the iron is diminished; or in diabetes, where it is increased; while it must not be overlooked that through neglect in ligating the umbilical cord there may be serious bleeding, which will diminish the amount of iron in the lungs.

The author claims that his method is applicable to the examination of lungs which are already in a state of putrefaction, where, of course, other tests cannot be applied; it is available, also, in cases where artificial respiration has been employed.[80 Nov.15]

Lowndes[187 July] reports an interesting case in which a desiccated state of a portion of the funis led him to conclude that the child had survived birth at least 24 hours, and had been murdered. The child's body was found concealed in a coal-cellar; a scarf tied tightly around the neck suggested the manner of the death. The appearance of the umbilical cord at once attracted attention; for about ½ an inch (1.25 centimetres) from the navel it was perfectly fresh; then came a line of demarkation, and the remainder of the cord, about 2½ inches, was completely mummified. There was no ligature. The body was clean. The lungs appeared to have been inflated in respiration, having a marbled aspect, buoyancy after compression, and an exudation of bloody froth on section. The stomach was empty. The internal organs were injected, showing that death was not by hæmorrhage. Around the neck were ecchymosed marks. The condition of the funis indicated to the reporter a vital process, and not one due to post-mortem desiccation.

Nikitin,[311, 1.40] of Moscow, formulates the following conclusions from his observations on the dead bodies of 124 newborn children: 1. The gastro-intestinal test not only supports the lung-test, but it is even able in some cases, in which the lung-test is negative, to afford evidence by itself of live birth. 2. If, in the fresh body of a newborn child the stomach, and especially if also the intestines contain air and float in water, it may with certainty be concluded that the child survived birth, provided air had not been artificially introduced into the stomach. 3. If the body is well advanced in putrefaction the gastro-intestinal test is less reliable than the lung-test, but if the body is only moderately putrefied the former test is as trustworthy as the latter. 4. A negative result from the gastro-intestinal test is not proof that the child was still-born, but if such a result is obtained from the application of both the hydrostatic and the gastro-intestinal test to fresh, but especially to putrid bodies, then it may be inferred that the child was still-born, except in rare cases in which signs exist of sudden death by violence immediately after birth. 5. If the stomach and a portion of the intestines are well filled with air, and the body is fresh, it may be concluded that the child did not die immediately after birth, always excepting cases of artificial inflation. 6. The first bubbles of air reach the newborn child's stomach by swallowing. 7. The possibility of "atelectasis secundaria neonatorum" —that is, of the complete disappearance of air from the lungs of a newborn child—must be admitted

DEATH BY DROWNING.

Mackenzie, police surgeon of Calcutta,[206, May] has published notes of 305 cases of drowning, giving the post-mortem appearances, of which the following is a summary:—

97.87	per cent. of the deaths were by asphyxia.
.32	" " " " " asphyxia and apoplexy.
.32	" " " " " syncope.
1.96	" " " " " modes of dying not ascertained.

In 91.1 per cent. of the cases the lungs were congested.
" 13.4 " " " " the lungs were swollen and distended.
" 18. " " " " the lungs were collapsed.
" 92.4 " " " " frothy and sanguineous fluid was found in the bronchi and in the air-cells; in only one case was mud found in the bronchi.
" 49.82 " " " " dark and fluid blood was found in the right cavities of the heart.
" 52.7 " " " " the liver was engorged.
" 61 6 " " " " the spleen was congested.
" 83.2 " " " " the kidneys were congested.
" 82.1 " " " " the stomach showed nothing abnormal.
" 1.6 " " " " the gastric mucous membrane was congested.
" 42.9 " " " " the stomach contained food.
" 16.7 " " " " it contained fluid matter.
" .9 " " " " it contained weeds with fluid material.
" .6 " " " " it contained mud and fluid.
" 22.6 " " " " it was empty.
" 85.2 " " " " the intestines were of normal appearance.
" 5.9 " " " " they were congested.
" 89.1 " " " " the large intestines were normal.
" 95. " " " " the vessels of the brain were injected.
" 75.73 " " " " the death was accidental.
" 2.62 " " " " the death was by suicide.
" .82 " " " " the death was by homicide,—only one in the list.
" 21.31 " " " " the manner of the death was not determined.

DEATH BY HANGING.

At the International Congress of Legal Medicine, at Paris, last August,[3] the physiology and pathological anatomy of death by suspension were the subject of an animated discussion.

Coutagne showed the importance of differentiating the phenomena and appearances which follow compression of the trachea from those which result from compression of either the blood-vessels or the pneumogastric nerves. When one dissects out these nerves and isolates them in the neck of a dog, and then passes a rope tightly around the neck beneath them, death is much more slowly brought about than in the cases in which the nerves are also included in the compression. With reference to the anatomical appearances, Coutagne insists on the value of a comprehensive study of all the data presented, to enable one to be conclusive in his post-mortem diagnosis of death by hanging; the external inspection is especially important. The examination of the viscera likewise gives valuable aid. The subpleural ecchymoses have lost much of the significance which Tardieu attributed to them as diagnostic data. The lung is swollen, but is not the seat of a true congestion; it is rather in a state of special change, to which Lacassagne has given the name "œdème carminé." The abdominal organs are sometimes congested to such a degree as to suggest poisoning as the cause. He did not believe that there was any single sign which, taken by itself, was pathognomonic of death by hanging, although in strangulation the ecchymoses observed were generally less circumscribed than those in death by suspension.

Richardière declared that he found it impossible, by the anatomical appearances alone, to diagnosticate a death by hanging from a death by mediate strangulation.

Vibert recalled Hofmann's observation that one may find all the lesions of strangulation on the dead body of one who has not been strangled at all, but who has fallen from a height.

Gosse related some experiments which he had made upon himself with reference to the phenomena in death by suspension. On two occasions he had carried the suspension to the point of loss of consciousness. He found that the cord did not compress the neck so as to stop the breathing. In cases where the cord pressed laterally on the carotids there was not much pain, but a buzzing sound in the head; this and the early onset of unconsciousness were features which he noted. If the rope pressed in front on the trachea the struggle for breath was distressing. Convulsions occurred when the lungs were empty at the time of the suspension. If, then, the culprit could fill his lungs with air just before the noose tightened the suffering would be diminished. The subpleural ecchymoses, too, are less distinct and less numerous if the cord tightens when the lungs are fully inflated.

Brouardel stated his belief in the impracticability of differentiating death by hanging from death by strangulation with a cord; and he declared that both topics should be studied together, as essentially the same. He did not think that the subpleural ecchymoses had a mechanical origin, but he acknowledged his inability to formulate any satisfactory explanation of their development. Concerning the erotic sensations formerly believed to be commonly attendant upon a death by hanging, Brouardel declared that we know to-day that nothing of the kind occurs. If, sometimes, there is a discharge of seminal fluid, it occurs in from fifteen to twenty minutes after death, and is due to cadaveric rigidity manifesting itself in the seminal vesicles. Moreover, everybody knows that among those who have been resuscitated after suspension no one has been found to testify to voluptuous sensations as a part of the proceeding.

TOXICOLOGY.

Arsenic.—A remarkable series of cases of arsenical poisoning at Hyères and Havre became the occasion of a very full and instructive report by Brouardel.$^{6}_{\text{Aug.10}}$ In this report Brouardel points out the fact that there are four distinct periods in arsenical poisoning—the first is marked by digestive troubles, the second presents eruptions and a laryngo-bronchial catarrh, the third is characterized by sensory troubles, and the fourth is marked by paralysis. In either of these stages, until the last is reached, it is easy for the observer to be deceived. One remarkable and hitherto unrecognized fact is stated; namely, that arsenic may be detected in the osseous tissue when there is no trace of it in the viscera.

In the medico-legal management of a case of arsenical poisoning, while the patient is still living, Brouardel suggests that linen soiled by the dejections should be secured as chemical material; that the urine should be drawn by the medical attendant himself, and submitted by him personally to a chemist for analysis; and that portions of the hair should also be subjected to chemical tests for arsenic.

The celebrated Maybrick case, in which, during the past summer, Mrs. Maybrick was accused and convicted of murdering her husband by poisoning, will take an important place in the literature of legal medicine. The motive of the crime appears to have been a vindictive feeling on the part of the woman growing out of domestic infelicity, coupled with a desire to transfer her affections to another man. The symptoms of poisoning were equivocal, and for a time misled the attending physicians; they consisted of moderate vomiting and diarrhœa, great thirst, weakness, cardiac distress, dry and red fauces, restlessness, tenesmus, with stiffness of the limbs and numbness of the hand. The sickness began on or about April 1st, and continued, with occasional exacerbations, until the death on May 11th. Arsenic was found in a bottle of medicine, the prescription for which made no mention of the poison; it was also in a bottle of Valentine's meat-juice, of which the deceased had received a portion. The arsenic was derived, in part at least, from fly-papers that were soaked in water. The poison was detected also in sundry bottles, packages, cooking utensils, remnants of food, and glasses found in the house. The post-mortem examination found no cause of death of a pathological character, but the appearances were consistent with the theory of irritant poisoning. Chemical analysis of the viscera discovered $\frac{1}{8}$ of a grain (0.008 gramme) of arsenic in the liver, with traces of it in the intestines and kidneys; the stomach and its contents and the spleen gave no arsenical reactions.

Carbonic Oxide.—Marcel Briant[8 Feb.13] observes that disorders of the intellect are not uncommon as the result of carbonic oxide poisoning, but that impairment of the memory must be regarded as a rare consequence. He cites a case in his experience as an illustration of this uncommon phenomenon. A young woman attempted suicide by burning charcoal openly in her bedroom; she was rescued in time to save her life, and one effect of her act was a total loss of memory concerning the details of her proceeding; this amnesia went to such a degree that she was entirely ignorant of the manner in which she received a burn on one of her arms, an injury produced in connection with her suicidal attempt. It was only after a period of several weeks that she recalled something of what had preceded her act, but everything connected closely with it was a total blank to her.

I have had under my observation a young girl who was exposed a short time (about three hours) to the poisonous effects of illuminating gas escaping in small quantity into her bedroom; she was not rendered unconscious, but had some transitory nausea. She declares herself unable to recall anything of the occurrence, or of the incidents immediately following; her behavior on the day after her exposure to the gas was perfectly natural, but she avows that she has no recollection of any of the events of that night or the following day.

Atropine.—A case of atropine poisoning, with recovery, is reported by Gibbard.[6 Nov.16] A woman aged 21 swallowed nearly an ounce of "eye-drops," containing a little less than 4 grains (0.25 gramme) of sulphate of atropia. She was first seen by a physician twelve hours after the solution was taken, salt and water having been given in the meantime as a domestic remedy to produce vomiting. On her admission to the hospital her face was flushed; her skin, lips, tongue, and buccal mucous membrane were dry; her conjunctivæ were injected, and her pupils were widely dilated and insensible to light; there were twitchings of the fingers and toes, with marked muscular tremor. The patient was restless and delirious, picking the bedclothes and muttering. Her temperature was 101° F. (38.3° C.), her pulse was 135, and her respirations 32 and irregular. There was no vomiting. There was retention of urine and exaggerated plantar and patellar reflexes. There was no eruption. Three hours after admission "she was given 3 minims (0.18 cubic centimetre) of the hypodermic solution of morphia." Free perspiration followed, and four and a half hours later another injection was given, followed by four hours of sleep. Next day the patient was much better, took food, and responded rationally to questions. Her skin was dry, however, and her pupils were dilated; her temperature was 103° F. (39.5° C.) and her pulse was 128. Constipation was a marked effect. She continued to improve and received no farther treatment. A week after her admission her pupils still remained persistently dilated; she was discharged on the twelfth day.

Springthorpe[285 Aug.] reports a case which in many respects is a duplicate of the one just quoted. P. M., aged 52, a druggist, had been drinking brandy to excess for some months. About 7.30 A.M., June 8th, he took 4 grains (0.25 gramme) of atropine, in the form of liquor atropiæ sulphatis. He was soon seen by a physician, who gave him an emetic. Some vomiting resulted, but the patient continuing to grow worse, he was sent to the hospital, where he was admitted at 10.30. He was then in a comatose condition, the breathing stertorous, the pupils dilated and insensible; the face was of a dull-red hue, but the rest of the body was of normal color. General sensation was not abolished, the pulse was rapid and running, and the hands and feet were cool. Without delay hypodermic injections of pilocarpine, morphia, ether, and caffeine were prepared, and the stomach-pump and battery were used. As the symptoms were severe, and only hearsay evidence existed as to previous use of emetics, the stomach was washed out, and about $\frac{1}{4}$ pint (118 cubic centimetres) of discolored fluid was removed; unfortunately, this was thrown away without examination. About $\frac{1}{2}$ pint (236 cubic centimetres) of hot, strong coffee was then injected into the stomach, and $\frac{1}{2}$ grain of morphia was put under the skin. Meantime, strong stimulation of the skin was tried, and caffeine was injected subcutaneously. Coma, however, became more profound, and the pulse began to intermit once in every five or six beats. At the end of an hour the pulse still intermitted, and was beating at the rate of 120 per minute. The respiration was normal in frequency and was less stertorous. General twitching of the limbs were observed. The urine was suppressed. At 8.30 P.M. he could be roused with some difficulty. The pupils were unchanged despite the morphia; the muscular twitching persisted. There was no eruption on the trunk or extremities. A great change, however, had come over the circulation; the pulse was now full and bounding.

On the following morning he passed a large quantity of urine. The patient about this time entered into a state like that usually present in the early stages of atropia poisoning. He became very delirious, with violent muscular movements and with hallucinations; but soon he began to improve and was presently convalescent. June 11th the pupils were still dilated and insensitive, but he could read a little, though slowly, like a child spelling. There was increased muscular movement on the least excitement. There was no diplopia. The pulse was 88. On the 14th the pupils reacted slightly, but could not be made to contract to the normal size, and the right was larger than the left. He was discharged on the 17th, the pupils being still dilated and vision not yet normal. Otherwise he was practically well. Taking 2 minims (0.12 cubic centimetres) as the outside medicinal dose of liquor atropiæ sulphatis, this patient took two hundred and twenty times the quantity permissible.

Chloral.—The so-called "Manchester cab mystery" is believed to be the first recorded case of homicide by chloral hydrate.[25 Aug.] A man, F., had been spending the day in Manchester, and had partaken freely of alcoholic liquors. At 6.20 P.M. he entered a cab with P., who was subsequently convicted of his murder, and they were driven to a public house where they each had a glass of beer. At 7.30 they re-entered the cab, and, in the opinion of the driver, the deceased was then sober; fifteen minutes later the driver found the cab-door open and the deceased alone inside, with his head fallen forward on the front seat. He could be roused and could speak. His valuables were missing. The cab-man drove to the Infirmary, but, on arrival there, F. was dead. The autopsy was made at 3 P.M. the next day; rigor mortis was well marked. On opening the body there was a strong smell of alcohol. The heart was a little dilated and contained dark fluid blood. Microscopically, there was found slight fatty degeneration of the muscular walls. There were a few patches of atheroma on the mitral valve and in the aorta, but all the valves were competent. The mouth and œsophagus were normal. The stomach was slightly congested and showed a few small submucous ecchymoses; it contained about 10 ounces of a yellowish fluid smelling strongly of beer; the contents of the intestines also smelled of alcohol. In the contents of the stomach and upper part of the intestines analysis discovered chloral, but none was found in the blood. The brain was congested, as were also the lungs. The liver was enlarged. The other organs were normal. Death was apparently due to syncope, the fatal effects of the chloral being probably accelerated by the existing cardiac depression resulting from an excess of alcohol in the system. How large a dose of chloral the deceased received was not determined; the prisoner, it was proved, had tried to buy 40 grains (2.5 grammes) of the drug of a chemist; this amount was refused, but, while the clerk was weighing 10 grains (0.6 gramme), the prisoner reached over the counter and seized the chloral bottle and escaped. On the day of F.'s death P. was seen to empty the contents of a small bottle into his own glass of beer, but was not seen to put anything into F.'s drink. The motive of P.'s crime was probably robbery, and not murder; but he was convicted of murder in the first degree.

URINALYSIS.

By ALLEN J. SMITH, M.D.,

PHILADELPHIA.

ALTERATIONS IN QUANTITY.

Polyuria.—This symptom, frequently spoken of as *diabetes insipidus*, should, in many cases, be referred not to its connection with the renal function, but to polydipsia, to which it is of necessity a secondary phenomenon. Such a case is mentioned by Westphal[4, Sept. 2] from Erb's clinic, in the person of a young woman, the diagnosis resolving into one of a nervous polydipsia which was easily and readily cured by the use of the bromides and valerian. The diagnosis of these cases of primary polydipsia rest largely upon the points first clearly marked out by Buttersack: the existence of perspiration in spite of the polyuria, the disappearance of the polyuria after enforced abstinence from water, the fact that the amount of urine voided does not represent the entire amount of water ingested, and the fact that micturition is apparently dependent in time upon the drinking of water. In a thesis upon the urinary neuroses in children, Guinon[1156] speaks of polyuria as being upon a par with nervous diarrhœa and with the ptyalism of idiocy. He remarks the immunity to the action of alcohol and medicines seen in these cases, and regards those that have arisen from trauma or from a febrile access as especially curable. Drummond[2, Oct. 26] records a case in his care of a man who was throttled roughly, and who several (seven) weeks later developed a polyuria, due, in the writer's opinion, to some injury of the vagus nerve. In the discussion Oliver mentioned a case of head injury, in which, after a period of insensibility of ten or twelve days, polyuria set in, but was readily cured by the use of valerianate of zinc. Cases of apparently simple nature are mentioned by Woodbury[760, Nov. 9] and Wagner,[8, Dec. 20, '90] in the latter case a co-existing chronic alcoholism being of some interest, in that, although strongly addicted to alcoholics for years, the excessive renal activity had readily eliminated the alcohol, thus preventing the occurrence of delirium, while, after temporary decrease of urine during a period of medication, delirium lasting for eight days occurred. In the treatment of true polyuria (diabetes insipidus) Da Costa,[60, Feb. 15] expresses himself as usually obtaining better results from the use of ergot than from any other drug, illustrating his remarks by a case of a man in whom there co-existed, although apparently without any relation, spinal hyperæmia, and by the case of a lady in his private practice in whom the symptom had been promptly relieved by this means. A careful study of the value of antipyrin has been made by Opitz, of Dresden,[41, Aug. 8; 80, Oct.] in 3 cases of long standing (one of twenty years' duration). The results were immediate, and all traces of the condition promptly disappeared—in one case permanently, in another for a long time after a withdrawal of the remedy; in the third case the quantity of urine at once rose to its former amount upon the withdrawal of the antipyrin, but upon re-administration fell again. Beginning the treatment, the medicament should be given to the amount of 2 grammes (31 grains) *per diem*, this amount increased by 1 gramme (15½ grains) daily until 6 grammes (1½ drachms) are reached or the amount of urine diminished; and after eight days should be omitted in order to see if the results are permanent. Similar results from the employment of this drug are reported by Kibbe[12, May] in a case of polyuria of fifteen years' standing in a woman aged 50 years; and Zenner,[53, June 8] reports a case in a boy of 12 years cured by the combined use of antipyrin, 0.5 gramme (7¾ grains), t. d.; powdered valerian-root, half-teaspoonful, t. d.; and galvanism to the cervical sympathetic and to the spine. The urine in this case amounted to 13,700 cubic centimetres (14 quarts) in twenty-four hours, and had a specific gravity of less than 1001. In a case in the Presidency General Hospital,[206, June] in India, under observation for several months, it was noted that, in order to produce any effect on the quantity of urine voided, if belladonna were given, it had to be administered in unsafe doses, and that as the effects of the drug passed off the urine again became preternaturally abundant.

Oliguria and Anuria.—Delamater[191, Jan.] mentions the case of a young woman, aged 27 years, of nervous temperament, in whom for two years the urine, although not of an abnormal character, has been markedly diminished, often not exceeding 9 or 10 ounces (280 to 310 grammes) in twenty-four hours. With this there is associated frequent and violent headaches, which disappear upon temporary increase of the excretion. A case of almost total suppression in a child, aged 2 years, for a period of seven days is recorded by Bernardy[82, Aug. 3] without any apparent cause, and seemingly without any specially untoward results, although during the period of suppression the ordinary symptoms of urinary intoxication were evident. Rossolymo[85, July 18] records the case of a young girl, aged 15 years, affected with marked and varied hysterical symptoms, in whom an oliguria, amounting at times to anuria, was cured by hypnotic suggestion. In Kansas, according to Fear,[199, Apr.] the broad-leafed prickly pear, or cactus, is quite successfully used as a domestic remedy in suppression of the urine. Bum[336, Apr. 27; 9, May 26] has made a number of experiments upon dogs which seem to indicate that massage of the posterior extremities materially increases the excretion of urine. He would explain this action by the influence of the massage upon the venous circulation, and confidently regards it as a valuable therapeutic measure in cases of suppression of the urine. (For other cases of decrease in the amount of urine, *vide* Retention of Urine, Renal and Vesical Diseases).

Sir William Roberts has shown that in health persons excrete during the day four or more times as much urine as during the night, the solids of the urine being about twice as much during the day as night. Following these observations, Wilson[6, Jan. 29] has made some study of the diurnal and nocturnal excretion in disease, finding that especially in cardiac and even more in renal disease the amounts are nearly approximated, and in renal disease the proportions of health are almost reversed.

The results of experiments by Spallitta,[6, May 18] undertaken to determine the influence of medullary and spinal lesions upon the urinary excretion, may be briefly stated as follows: Lesions of the cord at the base of the first dorsal vertebra produce no changes; sections at the seventh cervical and first dorsal permit the continuance of the secretion; at the sixth, fifth, or fourth cervical vertebra permit the continuance of secretion, but cause the appearance of albumen; at the third or fourth cervical vertebra, arrest the secretion, as, too, does electrical stimulation of the cord in the cervical region. From these results it would appear probable that the effect upon the renal secretion in such lesions is due to the division of fibres which control the urinary secretive function.

COLOR OF URINE AND COLORING MATERIALS

It is suggested by Humphreys[2, Sept. 16] that in the clinical examination of urine the color should be subjected to a standard color comparison for the purpose of record and investigation. Without attempting to inquire into the relative amounts of the usual urinary pigments, Humphreys would consider the mixture in endeavoring to reduce the question to a working base. The author compares the color of the urine with that of 4-per-cent. solution of the tincture of iodine (B. P.). The standard amount taken is 1 drachm (3.4 cubic centimetres); half of this is placed in a large test-tube, and water added until it is of exactly the same shade as sample of urine (previously cleared by warming or filtering, or, if still clouded, diluted in known proportions with water until clear), placed in a similar test-tube, and compared by means of light reflected through the two liquids from a sheet of white paper held close behind them. The test is performed twice, the sum of the diluted solutions being measured in cubic centimetres, and the result recorded either as a fraction with a numerator 1, or else this fraction multiplied by 1000 and divided out to give a convenient whole number, the total urine being reduced for the twenty-four to the normal, 50 ounces (1555 grammes) for men, 40 ounces (1244 grammes) for women. All the pigments in recently-passed urine being yellow, such a record would give the total coloring power of these yellow pigments, not, however, differentiating them. As the results of examinations recorded in this manner, it was noted that the pigment in normal urine is at its true maximum from three to five hours after a (nitrogenous) meal (like the excretion of the bile-salts, which have the power of causing solution of the red blood-corpuscles). It is increased by nitrogenous food, constipation, and severe brain-work. It is diminished during the night (although the first morning urine is highest in color) and by free action of the bowels. As to disease, a sudden leap from one extremity to the other, in either direction, is often the first sign of recovery. It is increased largely in acute febrile conditions, less so in parenchymatous nephritis, in some forms of anæmia (apparently when the waste of hæmoglobin is in excess of its formation), in hysteria, and in gastric catarrh. It is decreased markedly in uræmia of acute course, less so in renal cirrhosis and chronic uræmia.

Thudichum,$^{22}_{\text{Feb.13,20; Mar.13,20}}$ in a detailed article upon urochrome and its derivatives, confirms completely his original observations and adds a number of the later methods for the isolation of this substance and its products. Rosenbach, of Breslau,$^{4}_{\text{Jan.7,May 27,June 3,10;}}{}^{15}_{\text{Aug.}}$ calls attention to the occurrence of a red color obtained sometimes upon boiling urine with nitric acid. He regards this of some diagnostic value, the reaction taking place in three groups of diseases: in serious intestinal lesions leading to insufficiency of the gut, either by stenosis or obstruction, or impairment of the muscular power of the intestines; in varieties of more-severe diarrhœa brought about by acute indigestion; in chronic diseases where the nutrition is profoundly affected, as in phthisis or cancer. The change is noted by the addition of nitric acid to the urine after boiling for several minutes, a deep Burgundy-red color resulting, sometimes bluish red by transmitted light, and becoming turbid with a brownish-red pigment. This red color, which on shaking shows a bluish-red froth, may suddenly, after a time (sometimes only after the addition of 10 or 15 drops of acid, with the production of a slight effervescence), change to a reddish yellow and finally into a yellow. The pigment is the most resisting of the urinary chromogens, inasmuch as it is found in boiling nitric acid, in well-marked cases, to resist for a long time decomposition by the same acid. A close relation to indigogen apparently exists, the two chromogens existing together in all cases examined. Rosenbach concludes that as long as this reaction persists there must be marked interference with nutrition; that in case of intestinal obstruction the obstruction is not removed as long as the reaction shows; that after operation for the relief of this last condition the continued and unabating presence of the coloring matter indicates the failure of the operation. Rosenbach regards the substance giving rise to this reaction as a product of imperfect digestion of the albumens in the intestines, and states that it occurs along with indican and various carbohydrates, which indicate imperfect performance of the digestive function. The reaction seems to occur with constancy in cases of cancer of the intestines, very frequently in ulcerations in the digestive tract, and in cases of severe and prolonged diarrhœa in inanition. The reaction fails in cases of simple and tubercular peritonitis, in perityphlitis, in habitual constipation, and in gastric maladies unassociated with intestinal lesions. In cancer of the pylorus it does not appear until late,—until inanition is present. Rosenbach looks upon the real nature of the substance as the result of the action of a strong acid upon indol compounds and a phenol-forming substance—as a nitric salt of phenol and indol. Salkowski[4, Mar. 11] explains this reaction by the action of the nitric acid upon the urinary aromatics. The red color of the first part of the reaction, according to this investigator, results from the decomposition and oxidation especially of sulphophenic acid, while the yellow color is due to the nitrifying and oxidizing of these aromatics.

Rosin,[319, July 20] writing of this reaction, speaks of the peculiar coloring matter as indigo-red. He denies the position of Salkowski regarding the nature of the coloring material, and points out that the observations of the latter are in fault, in that he has mistaken for Rosenbach's reaction a change which occurs very often, even in normal urine, upon the addition of nitric or muriatic acids to the boiling fluid,—a rose-red color,—which does resemble the indigo-red reaction in that, after prolonged boiling with nitric acid, a yellow color is produced, but differs from indigo-red in that it is not soluble in ether, is broken up by the addition of alkalies, and may be entirely removed by acetate of lead. Rosin has been able to isolate the indigo-red substance, and finds that it corresponds with the properties of indigo-red (as studied by Berzelius, Schunck, Baeyar, and others). His method of isolation consists in permitting it to separate as a brownish-red precipitate after boiling the urine with nitric acid, and then collecting it upon a filter and taking it up with ether, in which it is readily soluble. Or it may be obtained in a pure state as an ethereal solution by cooling the test-tube in which the urine has been boiled in a glass of water, adding a small amount of ammonia to bring the reaction to alkalescence, and then adding a few cubic centimetres (a few minims) of ether and shaking it slightly. Ewald and Hamlich[8, Nov. 7] have, within the year, studied 47 cases in relation to this reaction. Among them were 13 cases of gastric cancer, in which, with one exception (cancer at the cardiac end of the viscus), the bluish-red reaction was well marked. In 5 cases of peritonitis the reaction succeeded, as, too, in 3 cases of ileus and 1 case of amyloid disease of the abdominal organs. In 4 cases of lead colic the reaction obtained as long as the colic persisted, disappearing upon its cessation. So, too, in 1 case of constipation and 2 cases of chronic diarrhœa, its success was at first marked, but later the reaction failed. It did not succeed in 1 case of cancer of the descending colon, in a case of ovarian cancer, in 3 cases of stricture of the œsophagus, and in 1 case of pernicious anæmia. In the other cases—gastric catarrh, dilatation of the stomach, typhoid and malarial fevers—the success of the reaction was questionable, the characteristic color not obtaining, but a brownish-red or deep rose-red color occurring. According to Ewald, in this series of cases, the relation between this indigo-red and indigo-blue was generally constant, differing thus from Rosenbach's results.

Churton,[6 Aug.24] in a paper upon indicanuria, states that he finds indican in the urine of typhoid and other forms of fever (in 12 cases of the former in all stages of its course) and in fæcal toxæmia. A number of observers experimenting upon this test have found its occurrence so general as to render its value questionable; and the following cases of indigo-calculus formation are further evidences of its relative uselessness as a diagnostic factor. Chiari[88 Dec.12,'88] reports a case of the formation of indigo-calculi in the pelvis of the kidney of a woman, aged 34 years, who had shown symptoms of calculous pyelitis for many years, and finally died in an uræmic condition. Both renal pelves were dilated and lined with a purulent fluid; and in the right one were a number of small calculi (about the size of a hazel-nut and less). blue-black in color, crumbling on pressure, and composed of calcium and ammonio-magnesian phosphates, a coagulated albuminous material, and notable quantities of indigo-blue. Besides the indigo-blue there was found present a deep purplish-red coloring matter, probably identical with indigo-red. The formation of indigo in this case is explained by Chiari by its precipitation in an alkaline solution from indol compounds, formed as the result of the suppurative processes in the pelvis. A similar case is mentioned by Kahler[88 Dec.12,'88] in a woman, aged 76 years, in whom there also existed hydrothionuria—a co-existence strongly suggesting a bacteritic origin for both. Following up this suggestion, cultivations were made from the urine, and growths obtained which possessed the power of developing a blue pigment material. I have met during the year a case of a child affected with digestive disturbances in whose urine amorphous masses of indigo-blue were found, but in which, at least once, these amorphous masses were replaced by minute rhombic crystals of a blue color.

Melanuria.—Von Jaksch $^{83}_{a.13,a.4}$ publishes a series of observations upon the properties of urine containing melanin or its colorless precedent, melanogen. He concludes that the reagent most sensitive for these substances is the perchloride of iron, which gives an intense black color to those urines containing even small amounts; that the coloring material formed by the addition of nitroprussiate of soda and the mineral acids is Prussian blue, and that this last reaction is not limited to these substances, but may occur in urines containing marked amounts of indigo-forming bodies. Pollak $^{84}_{\text{Sept. 23 to Oct. 12}}$ records a case of melanuria occurring in a patient the subject of melanotic sarcoma of the liver. The urine when passed was clear, yellowish, or reddish yellow in color, but on standing a few hours in the open air or upon being treated with oxidizing reagents became black. This black color is not only apparent by reflected light, but should also be noticeable by transmitted rays. Unlike a number of other observers, Pollak is unable in this instance to recognize any connection between the presence of the melanuria and the specific weight, although this was constantly somewhat increased during the course of the case (1021 to 1035). This writer, independently from von Jaksch, concluded from his observations that the perchloride of iron furnishes the most sensitive and reliable test for the color substances in these cases, adding the reagent, drop by drop, to the urine. While a somewhat similar appearance may occur in urines containing little or no melanin, there is a difference in this, that only in the case of melanuria is the black color preserved to the eye by transmitted light. If the urine be acidulated with sulphuric acid and then treated with a weak solution of potassium bichromate, it at once becomes darker, and upon heating assumes an intense black color, presently throwing down a heavy black precipitate. If the urine be treated with hydrochloric acid alone it deepens in color slightly, and on heating becomes brownish black. This last reaction is, however, produced as well by uromelanin in almost any normal or pathological urine. There is, however, this difference upon treating with amyl alcohol: uromelanin may be removed, while melanin cannot. Melanuria is a rare occurrence, and is probably more frequently seen in association with pigmented neoplasms than elsewhere; by some authorities it is said to occur occasionally in certain malarial conditions. Stiller, of Buda-Pesth, $^{84}_{\text{Apr. 4}}$ records a case of melanuria occurring under just the same circumstances as the one of Pollak's,—in connection with metastatic melanotic new formation.

Reaction of the Urine.—Woods[2, May 13] suggests as a test-liquid for the presence of free acid in the urine iodized lime-water, which, in the presence of a free acid, is decomposed, giving the free iodine to the fluid and coloring it brown (or blue, upon the addition of a small amount of starch-paste), but is not acted upon by salts. Gaube[191, Jan.] states that the acid properties of the urine in acetonæmia and acetonuria are largely due to the acid salts of lactic and phosphoric acid, usually combined with potassium as a base; in other conditions than these the acidity of the urine in the acid diathesis (oxycrasia) is due usually to acid urates and phosphates. Grouzdeff,[67, Oct. 15] from a series of observations, concludes that perspiration exercises no influence upon the degree of urinary acidity.

Specific Gravity of the Urine.—Ruttan[282, July] suggests a modification of the common Squibb urinometer, which consists in having the urine-tube fluted, the float being made of a doubly conical shape in its enlarged portion. These modifications are intended to prevent the float adhering to the sides of the tube, and thus lessen one of the errors of this means of taking the specific gravity. Oliver,[25, Oct.] in his recent work on urine testing, observes the gross errors which the small pocket urinometers are apt to lead to, and suggests that a much safer method in bedside work is the employment of a small specific-gravity bead in equilibrium in a liquid of specific gravity 1008. When the urine has a higher density, the bead will, of course, float, and water must be added until the bead begins to sink in the well-mixed liquid. The tube in which this is performed is graduated carefully, and the amount of dilution and corresponding specific weight may be read from its markings.

ALBUMINURIA.

The general trend of medical opinion as to the existence of a form of albuminuria of an essentially physiological character would seem to lead to the disapproval of this idea in its fullest meaning. While, perhaps, the opinions as to the existence of an albuminuria of slight significance, curable in nature and preventable by hygienic measures, are as strongly expressed and upheld, there is no doubt but that the bulk of evidence would lead one to catalogue the majority of these cases either as of pathological origin or, if permitted to continue, as having a pathological end.

At Leeds, during the session of the British Medical Association, Pavy$^{6}_{\text{Aug.3,Sept.14}}$ expressed practically the same views which he is well known to have held upon the subject for several years. In this author's view albuminurias of renal origin are to be divided into three clearly-defined classes in the order of their pathological gravity and prognosis. There is to be recognized a form in which there is to be found but a trace of albumen in the urine, and this not constantly, unassociated with renal lesions and falling within the limits of the so-called "physiological" variety. There is the second class, which is also, in Pavy's opinion, unassociated with renal organic disease,—the "cyclical" or "intermittent" albuminuria; and the third, a class in which there is constantly a notable quantity of albumen present. In the discussion following Pavy's remarks, he was supported in his views as to the existence of an albuminuria of renal origin unassociated with organic disease of the kidneys by W. J. Tyson and Saundby, and to a less degree by Drysdale, Gairdner, and Eddison.

Bisbee$^{60}_{\text{Dec.15,'88}}$ publishes the records of a case of cyclical occurrence, recognizing a functional element in the causation of the condition. Ruttan, in a paper upon the proteids of the urine, favors the recognition of a form of physiological albuminuria separated by no hard and fast lines from the pathological form. Barrs,$^{26}_{\text{Jan.,Feb.}}$ in an article upon the clinical significance of this symptom, recognizes a condition of functional albuminuria, but distinctly separates it from renal fault, refusing to regard it as a physiological appearance, and referring it for origin to more generally acting causes than those of Bright's disease, poisons, pyrexia, cardiac disease, etc. (Semmola, *vide* ANNUAL, 1889.) Distinctly opposed to these writers, Johnson$^{2}_{\text{Feb.1}}$ regards the presence of albumen in the urine, no matter how small the quantity, as invariably pathological, arising from a variety of causes, but having no features upon which to base such terms as "functional," "physiological," or "cyclical." He looks upon every case of these varieties as originating in an acute nephritis, more or less remote, adducing, as a circumstance in his argument, the fact that in its course to recovery nearly every acute nephritis presents, in a greater or less degree, an intermitting character. With regard to the question of life-assurance, this writer would not permit any individual with a trace of albumen in the urine to be accepted, since, to say the least, such a person must exercise care and prudence, "and no office can insure care and prudence." Malfatte,[6 July 10] from careful observation of a case of apparently physiological albuminuria in a healthy man, controverts the belief that serum albumen may be regarded as one of the normal constituents of urine; and states that, at least in the case observed by him, the body which had given the impression of albuminuria was really a form of mucin, readily broken up into true mucin and a peptone-like body.

While among English writers Pavy is generally regarded as having pointed out this class of albuminurics, Klemperer[4 Sept. 30] would assign the credit of priority in observation of the so-called physiological albuminuria to Leube, as having as early as 1877 published an account of the condition. Further, the peculiar form known as "cyclical," which is generally accredited to Pavy, this author attributes to von Noorden in point of time, although the English writer seems to have made the first complete observations upon the condition. In the same paper the writer mentions a typical case of the cyclical variety, and another which should probably best be classed with the postural variety, standing or walking invariably inducing the appearance of albumen in the urine, while so long as the patient remained in bed, no matter how much work was performed, its presence failed. From a prognostic view Klemperer regards these manifestations as quite harmless. A contribution of marked interest from an etiological and prognostic stand-point is made by Dickinson,[2 May 11] who presented before the London Pathological Society a kidney belonging to a member of a family in which albuminuria had been hereditary certainly for four generations and possibly for more. The particulars of this family, as far as can be ascertained, are as follow: The first generation consisted of a brother and four sisters. The brother died suddenly, after a long wasting of "kidney disease in some shape," at the age of 34 years. Of the sisters two died at the respective ages of 49 and 48 years, each having had an albuminuria of many years' existence. The brother left six children,—two sons and four daughters. Of these six, four became the subjects of albuminuria, the second son dying at the age of 26, having had it since the age of 12 years. The eldest daughter died with it at the age of 39 years, having manifested its presence since the age of 16 years; the second daughter still lives with an albuminuria; the third daughter died from an albuminuria complicated with glycosuria. All of the sisters left children. Two of the four transmitted albuminuria. The eldest sister left six children, presently to be mentioned. The third left five, one of whom had albuminuria. These constituted the third generation. Of the six children of the eldest sister, five became subject to the symptoms and only the second son escaped. The third son died with it and was the subject of further particulars. The condition presented itself in the fourth generation in the person of the only child of the eldest sister, which was born with albuminuria. To the above facts Dickinson added others showing the existence of the albuminuria in a collateral line. The portraits of the family existed from the time of Edward IV, and showed a peculiar pallor (which might, however, have been due to age) quite characteristic of the later and living members. Generally speaking (but evidently not in all the cases), the most of these instances presented evidence of the existence of renal disease in the presence of casts in the albuminous urine; and in the case of the third son in the third generation above referred to a post-mortem examination presented the specimen shown by Dickinson,—a granular, contracted kidney of marked intensity. Aside from further knowledge of the character of the individual cases, the editor would be disposed to regard this series of instances as indicating a marked relationship between those examples of an albuminuria arising without actual organic renal disease and those in which renal structural alterations are clearly manifest. That there is a tendency for these cases of functional albuminuria to eventually end in renal fault is strongly witnessed by the experiments of Arthaud and Butte,[3] July 21 upon the morbid physiology of the pneumogastric nerve in relation to the membranes and viscera supplied by it. These observers conclude that in certain cases there arises a neuropathic albuminuria separated in clinical features from Bright's disease by the pre-existence and co-existence of a number of phenomena of the parts supplied by this nerve. They recognize three distinct periods in the course of this symptom,—a prodromal period of considerable duration marked by gastro-cardio-pulmonary symptoms, during which no albumen is present in the urine. There follows a second period, during which the premonitory symptoms persist and are accentuated, and a slight transitory albuminuria occasionally occurs. Finally, if the disease runs its course the albuminuria becomes constant, and in this last period the usual symptoms of Bright's disease dominate the pathological scene.

The form of functional albuminuria denominated by Moxon in "Guy's Hospital Reports" for 1878 the albuminuria of adolescence has been the subject of some discussion arising from a refusal to accept such a variety by Johnson in the paper above referred to. Lucas, $^{2}_{\text{Feb.16,Mar.2,9,Apr.16}}$ in a criticism of Johnson's article, points out that the proper interpretation of Moxon's classification is not so much the period of life at which the condition occurs as its dependence upon the practice of masturbation so frequent at this age, and in his views is supported by Fox. $^{2}_{\text{Mar.2}}$ This interpretation places a new factor in consideration which Johnson $^{2}_{\text{Feb.23}}$ is not, however, disposed to accept,—a position in which he is sustained by the experience of Dukes, $^{2}_{\text{Mar.16}}$ physician to the Rugby School, and Stirling. $^{2}_{\text{Apr.6}}$ The relation between the practice of sexual self-abuse and the appearance of albumen in the urine, apart from structural changes in the kidney, is, to a certain extent, suggested by the condition of general relaxation which is marked in cases where the practice is excessive in youth; the exclusiveness of this factor as a cause for the albuminuria at this period of life, is, however, at once negatived by the fact that albuminurias, to all evidence identical, occur in all sexes and at ages under circumstances distinctly separated from the above.

As to the frequency of albuminuria in diseases other than Bright's disease of the kidneys, the researches of Talamon and Lecorché, $^{345}_{\text{July,Aug.}}$ mentioned in the ANNUAL of 1889, contains considerable information. These observers compiled statistics of 350 cases, of whom 184 (52.5 per cent.) were albuminurics, dividing them into four classes: (1) the tuberculous, 97 in number, of whom 46.3 per cent. presented albuminuria; (2) those suffering from cardiovascular affections, 81 in number, of whom 65.4 per cent. were albuminurics; (3) patients with slight affections, febricula, rheumatoid pains, neuralgia, dyspepsia, varices, hysteria, anæmia, 106 in number, of whom 33.3 per cent. were albuminurics; and (4) those suffering from acute febrile diseases and various apyretic or chronic medullary, hepatic, pulmonary, or other affections, 66 in number, of whom 38 were albuminurics. In the old, in diseases not distinctly renal, between the ages of 60 and 70 years, of 56 patients, 48 per cent. were albuminurics; between 70 and 80 years, of 80 patients, 60 per cent. were albuminurics; between 80 and 90 years, of 21 patients, 71 per cent. presented albuminuria. Thus, out of 157 subjects between the ages of 60 and 90 years, 57 per cent. showed albumen to be present in the urine. Of these 157, 73 died before the publication of the report, and besides the prominent affection 56 of these manifested an albuminuria. Of these 56, in only 12 was the albuminuria found to be separated, so far as a casual examination of the kidneys was concerned, from notable structural alterations of the kidneys, although in all these cases the albuminuria was not the prominent symptom of their maladies. Lantos$^{95}_{\text{B.M.,H.3}}$;$^{2}_{\text{Jan.12}}$ found albumen in the urine of 18 per cent. of 70 pregnant women, while in nearly 60 per cent. of 600 newly-delivered women the urine contained albumen. It was detected in over 70 per cent. of 268 primiparæ and over 50 per cent. of 332 multiparæ. The percentage was distinctly lower in premature labor, and very much decreased in cases of abortion. The presence of casts was determined in but a small proportion of the cases. The writer concludes that, putting aside all evident and probable cases of nephritis in pregnant women, albuminuria is not rare in pregnancy and is quite common after parturition. He refers the symptom to a reflex irritation of the vasomotor nerves of the renal vessels, and does not look upon it as of special pathological significance. Cases bearing upon the relation of this phenomenon and pregnancy are mentioned by Peter,$^{100}_{\text{Feb.21}}$ and Taneyhill.$^{104}_{\text{Jan.12}}$ Leyden,$^{13}_{\text{Sept.}}$ from records of several cases, would refer the phenomenon usually to the occurrence of true renal inflammation.

The relation of the symptom to acute febrile attacks has been the subject of clinical study in several instances, but the question of the origin of the albumen in these cases cannot by any means be regarded as determined. André,$^{78}_{\text{Aug.17}}$ from a number of observations, states that in typhoid fever any albuminuria occurring, as a rule, comes early and disappears quickly. Ekkert$^{59}_{\text{May 4}}$, has recently studied phases of this subject in children in 100 hospital cases, of which 31 were cases of acute infectious disease, 7 of petechial typhus, 19 of typhoid, 2 of recurrent, and 2 of intermittent fever. From these cases the author concludes that in typhus and typhoid fevers albuminuria is a very common phenomenon, occurring in three-fourths of all children who have these diseases, appearing most commonly in the first week or even the first days of the affection, and lasting usually about one or one and a half weeks, the quantity of albumen bearing a close relation to the intensity and duration of the attack. A certain number of the acute exanthematous diseases were also studied by this writer,—measles, diphtheria, and scarlatina. The conclusions as to these diseases indicate that the appearance of acute eruptions is usually attended by febrile albuminuria, depending for its intensity and duration upon the intensity and duration of the accompanying fever. It is usually of brief duration and rarely of prognostic significance. (This, however, has no reference to the nephritic changes which frequently occur in the late stages of scarlet fever, which not rarely lead to chronic renal changes). Martinez,[6 Feb.2] writing of albuminuria and yellow fever, states that from his experience the usual recommendation to judge of the severity of the case by the intensity of the albuminuria is untrustworthy, since in some comparatively mild cases the virulence of the disease is occasionally manifested almost entirely by its action upon the urinary function. In a clinical lecture upon the subject of nephritis, Peter[55 Dec.15,'88] brought before the class a case of albuminuria persisting since a slight attack of variola some months previous, arising probably, as in scarlatina, from actual nephritic changes. While this question of the origin of albumen in the urine in these acute fevers is, to a certain degree, problematical, it would seem, from our present knowledge, proper to refer the symptom in each case to one or several of three possibilities. In the early part of the course of the case not rarely there occurs a slight, passing albuminuria without further evidence of renal fault; in many cases, at least, this should be regarded as belonging to the hæmatogenous variety of Semmola, due to an albuminæmia the result either of destruction of the blood-globules by the disease activity or to a failure of the proper changes of the albumens of nutrition and their consequent presence in the blood. This may be aided, or possibly the symptom entirely induced, by alterations in the vascular nervous influence, thus producing changes in the hæmic pressure in the renal area; or the intensity of the microbic activity underlying these affections may, in the process of the elimination of the *causa morbi*, produce sufficient actual renal change to cause a true nephrogenous albuminuria, although the cases included in this last category usually persist, and later present themselves as chronic Bright's disease. So, too, the persistence of the first two causes could scarcely end otherwise than in renal change, and be perpetuated as a chronic form of Bright's disease.

That albuminuria exists with an increased blood-pressure is not to be doubted, but whether this heightened pressure stands in causal relationship has been questioned. The usual teaching and the older is, however, favorable to such a relation, as exemplified in Ralfe's article$^{6}_{\text{Nov.17,'88}}$ upon functional albuminuria. There are those, however, who recognize the existence of albuminuria under the opposite condition, that of diminished pressure (Wiley$^{6}_{\text{Dec.8,'88}}$), and a certain number believe this diminished hæmic pressure to hold an actual causal relation to the condition (Craig$^{6}_{\text{Dec.1,'88; Jan.5}}$). Rendu$^{211}_{\text{Oct.13}}$ reports a case of albuminuria in a woman aged 38 years, caused by pressure from a large ovarian cyst, the albuminuria disappearing after removal of the cause.

TESTS FOR ALBUMEN IN THE URINE.

Sulpho-Salicylic Acid, $C_6H_3\left\langle\begin{matrix}SO_3H\\OH\\COOH\end{matrix}\right.$, is proposed by George Roch$^{575}_{\text{p.540}}$ as a test reagent for albumen in urine. A few crystals of the acid are placed in a tube containing the clear urine, and the mixture shaken until the crystals are quite dissolved; the appearance of a turbidity shows the presence of albumen. Solutions of urea, uric acid, peptone, glucose, and normal urine show the same turbidity, but only after some length of time. Experiments to determine the delicacy of the test, employing solutions of commercial egg-albumen, indicated that in perfectly clear solutions 0.005 per cent. of albumen could be detected.

Heller's Test.—Ruttan$^{282}_{\text{July}}$ suggests, as a modification of Heller's cold nitric-acid test, that the urine and nitric acid should be separately warmed in test-tubes, and that by means of a glass pipette a small amount of acid be placed at the bottom of the urine-tube and allowed to float upon the surface of the warm urine. By this means Ruttan claims the reaction is more sharply defined, and that in the warm solution the urates are not precipitated by the acid. For the best results the urine should invariably be filtered if in the least turbid.

Albumen Test-Paper.—Carette,[67 Feb.] investigating the value of Hoffmann's albumen-paper, gives the following directions for its best preparation, differing somewhat from the usual. Two solutions are made: the first of 1 part of bichloride of mercury in 20 parts of distilled water, the second of 2.6 parts of chemically-pure iodide of potassium in 5 parts of distilled water. These solutions are mixed, thus forming the double iodide of potassium and mercury. A proper manipulation will have left this solution perfectly clear and without precipitation. Into this double iodide solution strips of filter-paper (Berzelius paper being the best) are placed until saturated, then removed and dried. In testing the urine with these papers the urine should be filtered if not clear, rendered acid with a few drops of acetic acid; if there be albumen present, upon immersing a slip of paper in the urine there will a distinct precipitation take place. A number of vegetable alkaloids respond to this reaction.

Trichloracetic Acid.—Boymond[266 Oct.; 2 Nov.16] recommends the employment of trichloracetic acid, first proposed in 1881 by Raabe, for the purpose of recognizing such albumens as are not thrown down by acetic acid and heat (albumose, etc.). It is used as is nitric acid in Heller's test, and for the same class of albumens. This substance is obtained by the action of chlorine gas upon acetic acid, and is a solid crystalline body very soluble in water. It may be employed for this test either in the solid or dissolved state. If it be used as a solid a small fragment is placed in a test-tube containing the urine, where it sinks and readily dissolves, producing a cloudiness or, in quite clear liquids, a zone of turbidity. Used as a liquid, a saturated solution is best, which, being placed upon the surface of the urine, produces a white ring, as in Heller's test, but without producing any coloration. When there is much sodium urate present in the urine it had best be diluted with an equal quantity of water.

Christensen's Quantitative Method.—In an article by Christensen[20 Jan.] upon the method suggested by himself, and noted in the ANNUAL of 1889, this writer describes the apparatus and details of the method. For convenience he employs a burette so graduated that each marking represents to 1 per mille of albumen; this burette is provided with a pyriform enlargement, in which, the opening being closed by the finger, the reagents may be mixed with the urine for the precipitation of the albumen and its emulsifying before undertaking the optical portion of the test. The precipitating reagent is recommended to be made up of 1 part of tannic acid to 100 parts of a saturated solution of borax, the resulting solution being a permanent one. The albumen being precipitated, it is emulsified with a solution of gum arabic of known and constant proportions in the pyriform enlargement of the burette. This accomplished, it is passed by drops from the burette into a small glass dish, filled from one-third to one-half of distilled water, and placed over a paper ruled with alternate black and white lines. When the water is so clouded as not to permit the lines to be distinguished any longer, the amount of albuminous emulsion required is read from the gradations of the burette, each degree representing 1 gramme (15 grains) of albumen in 1000 cubic centimetres (2 pints) of urine. The method is acknowledged by its author to be only approximate, the possibilities of error existing in individual capability to recognize the lines, in the quantity and intensity of the light, in the amount of sodium chloride present and the temperature as influencing the degree of precipitation.

Gravimetric Test.—Patein$^{152}_{\text{Aug.,24}}$ points out, in the quantitative estimation of albumen in urine by precipitation by acetic acid and heat and filtration, that if when the precipitate is collected on the filter it be washed with water acidulated with acetic acid, there is a possible source of error. There exists sometimes an albumen precipitable, as is ordinary serum-albumen, by heat, potassium ferrocyanide, nitric acid, etc., but differing from it in being redissolved after coagulation by acetic acid. In order to avoid this loss in employing this method, it is best to test the washings with nitric acid.

Differentiation of Urinary Albumens.—In order to separate serum-albumen from globulin, Paton$^{36}_{\text{Dec.,'88}}$ suggests the following procedure. The total proteids (in most cases, only serum-albumen and serum-globulin) are determined carefully by means of Esbach's tubes, several tubes being employed and the average accepted. Fifty cubic centimetres (1.69 fluidounces) of urine are then put into a flask, and, after being rendered faintly alkaline by several drops of potash solution, are treated with sulphate of magnesium in powder, constantly agitating the fluid until a full solution is obtained. This is permitted to stand in a warm place for twenty-four hours, when the solution is filtered, and the filtrate subjected to the usual Esbach process. By this means the serum-albumen (which escaped precipitation by the magnesium sulphate) is thrown down and the result noted, the difference of registrations indicating the amount of serum-globulin.

For practical examination of the urine for proteids the same writer has conveniently tabulated the procedures as follows: 1. Acidulate the urine with acetic acid and boil; if there be a precipitate, it is either *serum-albumen* or *serum-globulin*, or both. 2. Separate this precipitate by filtration (or use clear urine if there has been no precipitate in the above step), and apply either Heller's cold nitric-acid test, or the test with acetic acid and potassium ferrocyanide; if there be a ring formed, it is *hemialbumose.* 3. Separate hemialbumose from the above filtrate (or use clear urine if there has been a precipitate in neither of the above steps) by adding pulverized ammonium sulphate to saturation, and remove the precipitate by filtration. The filtrate should be tested for *peptones* by the employment of picric acid (Esbach's solution) or Fehling's solution. 4. To separate *serum-albumen* from *serum-globulin*, the urine should be rendered alkaline by the addition of several drops of potassium-hydrate solution, and then treated to saturation with magnesium sulphate. The resulting precipitate of serum-globulin being separated upon the filter, the filtrate is acidulated and tested for serum-albumen by heat or strong acid.

Separation of Globulin by Indifferent Substances.—Some extremely interesting results are published by Boymond[266 Oc.] upon the precipitation of albumen by certain substances. With the purpose of clearing the urine of the turbidity from bacteritic origin he treated specimens with washed talc (washed in muriatic acid, then in distilled water, and dried) and then filtered. A clear, limpid liquid resulted, partially decolorized. Urines which contained albumen only in the form of globulin after this procedure failed to show any turbidity, either upon heating or upon treating with any of the ordinary reagents. Further, this precipitation was observed only in relation to globulin in those urines containing serum-albumen and serum-globulin. Extending his experiments to other so-called indifferent substances, as washed animal charcoal, carbonate of lime, phosphates of lime, carbonate of magnesium, calcined magnesia, and bismuth subnitrate, he observed practically the same phenomena, save that, in case of bismuth subnitrate, both serum-albumen and serum-globulin were removed, and the filtered urine contained no trace of either. Animal charcoal seemed to have the same power, but failed frequently to precipitate the whole amount. The other substances acted only on the globulin. The writer does not attempt to explain the relations existing in these reactions; a further series of substances—the metallic oxides—is proposed as a continuation of these same experiments.

Peptonuria.—The state of our knowledge of this phenomenon has been reviewed by Raymond[288, Sept. 8] in a lengthy paper. Briefly, the presence of peptones in the urine as a symptom was first pointed out by Gerhardt, who found it present in the urine of cases of diphtheria, pneumonia, typhoid fever, phosphorus poisoning, etc. Since then (1866 to 1871) considerable advance has been made, chiefly by Obermüller, Senator, Petri, Maixner, Jaksch, Hofmeister, Quinquaud, Wasserman, Sée, Bouchard, and others. The conditions in which the peptones are discoverable in the urine may be arranged in these classes: 1. Whenever in the organism, after an excessive formation of white blood-corpuscles, there is a destruction of these globules, as after the absorption of an exudate, as in purulent pleurisy, pneumonia, from phthisical cavities, bronchorrhœa, pyopneumothorax, suppurative bone-lesions, acute articular rheumatism (where these corpuscles are destroyed by the salicylate of sodium). 2. Whenever there is a destruction of the normal leucocytes, as in scurvy, phosphorus poison, and the infectious fevers. In the above two conditions, the white corpuscles being broken up permit their peptones to be dissolved in the blood, and, later, to be passed through the renal tract into the urine. 3. Whenever the peptones are found in too great quantity in the economy for the leucocytes to fix them, thus permitting their escape. This is seen in the transitory hyperproduction of peptones after the digestion of the albumens, and in cancer and sarcoma. 4. When the peptones cannot be transformed into an assimilable albumen in passing from the digestive tract, or when present in the blood are not broken up in the liver. This occurs in various stomach and intestinal derangements and in hepatic diseases.

The special value as a symptom apparently hinges upon the relations to the white corpuscles, either in the blood or as suppuration cells; or upon the excessive formation of the peptones in the intestinal tract or their decreased metamorphosis in the liver. The question of the character of an exudate, simple or suppurative; the nature of an inflammation, specific or simple; and the character of some dyscrasia may all be influenced by the presence of peptone in the urine as a symptom. The methods of determination recommended by Raymond depend upon the biuret reaction, the special difficulties existing in the intensely-colored specimens of urine and in the co-existence of the other forms of albumen. In the estimation he advises that the coloring matter be removed as far as possible by filtration (best through animal charcoal), and the albumens be excluded by methods proposed by Hofmeister (treating the urine with acetic acid and phosphotungstate of sodium, washing the precipitate with a 4-per-cent. solution of sulphuric acid, and treating on final solution with the biuret reagent), or by Georges (precipitating the albumens by Tanret's reagent and washing from the precipitate the peptones by boiling water, after which the filtrate is treated with the biuret reagent). Isaakidès[1010; 126, Oct.] mentions an interesting case of peptonuria and propeptonuria in a case of Bright's disease, where it would seem that the albumen in the urine had undergone a partial digestion in the bladder, being thus in part transformed into peptone and propeptone.

Propeptonuria.—This condition has been noted in a large proportion of cases of measles (9 out of 12 cases) by Loeb.[319, No. 15; 5, Aug.] The author notes that in relation to the diazo-reaction found so uniformly in cases of measles by Fischer, a well-marked diazo-reaction occurred whenever peptone was present, but not always the reverse. He believes the origin of propeptone may possibly be in the liver, which is found enlarged in these cases, or more probably in the condition of the skin (since it is found in scarlatina, urticaria, dermatitis, etc.). Nitric acid, added cautiously by drops, produces in these cases a white, flocculent precipitate, dissolved by heat, but re-appearing upon cooling; concentrated acetic acid as well as strong solutions of sodium chloride act similarly. The existence of propeptone in the urine of the insane, especially of acute maniacal and excited cases, is noted by von Köppen.[368, B.20, p.366]

HÆMATURIA.

The appearance of a few drops of blood in the urine at the end of micturition has generally been regarded as pathognomonic of some lesion, traumatic or otherwise, of the neck of the bladder or of the prostatic urethra. In a carefully-considered paper, Bazy[3 Oct. 30] objects to such acceptance, basing his objections upon a number of cases detailed in the paper. He has had this terminal hæmaturia occur in cases in which he could clearly exclude any deep urethral or cystic troubles, and in which in each case there was recognizable some anterior urethral lesion. Under such circumstances the hæmaturia must be regarded as truly terminal in time, the actual hæmorrhage not occurring until toward the close of micturition; or else there has been a slight hæmorrhage throughout the passage of the fluid, which was, however, in sufficient bulk at first to prevent any notice being taken of the blood. Chicken[2 Feb. 21] reports 5 cases of hæmaturia depending upon subcapsular rupture of the kidney. According to this writer such an accident might occur from more-common and slighter cause than would be ordinarily supposed. Simple muscular effort, as in rowing or in heavy pulling, when it is necessary to exert some force to prevent falling forward, has, according to Chicken, to be accorded a causative value for such lesions. French,[53 May 4] after discussing the subject, quotes from his practice 3 cases of hæmaturia, due in one case to calculous presence. In the second the writer evidently regards the case as due, at least remotely, to malarial infection, although at the time of observation this was not active. "The red disks in the third were markedly pale, almost colorless, and had a globular form," but further suggestion of malarial infection was not present; there was, however, a history of previous prolonged malarial poisoning. Molloff[770 Nos. 1, 2; 26 June] relates a case of malarial hæmaturia in which, without the presence of stone, there were present symptoms suggesting vesical calculus,—hæmaturia, frequent and painful micturition, vesical tenesmus, sacral pain, and sleeplessness. The urine contained, besides red blood-cells, hyaline casts and albumen. Along with these symptoms there were daily rigors, fever and sweat lasting several hours, and beginning about noon. Muriate of quinine caused the immediate disappearance of all symptoms of the case. Chevalier[35 Apr. 18] reports a case of hæmaturia in a boy aged 8 years, which he suggests may have been hereditary, the mother having been born (and lived for fifteen years) on the Isle of Mauritius, where hæmaturia is endemic. After prolonged treatment recovery followed. In the paper there is no further evidence of the possibility of hereditary origin than the coincidence mentioned of the mother's life. Lebec[152, Apr. 11] mentions the case of a young woman in his practice in whom, at the time of menstruation, after a short walk the flow suddenly stopped, a hæmaturia setting in and lasting for several weeks. This was accompanied at first, at least, by renal pains. Later, menstruations were quite normal. The writer suggests it as a case of vicarious menstruation. Chapin[1, Apr. 6] publishes the records of a hæmaturia in a male with regular monthly occurrence, and regards it as of an essential nature, established for the relief of plethora. The patient, aged 58 years, weighing 200 pounds (100 kilogrammes), married, always had enjoyed good health. In February of 1888 he fell, apparently without sustaining any injury except "a slight strain." Three weeks later there was blood in the urine for several days, then none for a month, and thus on. Each period was preceded by nausea, pain, dizziness, heaviness in the lumbar region, and sometimes headache. The periods were very regular, recurring to the day. Occasionally small blood-clots were passed. There was no cystitis, no urethritis; no albumen or casts appeared in the urine. This condition continued for nearly a year, but was finally stopped by the use of gallic acid before and during the expected period. Fabre[55, Sept. 16] mentions a case of passing hæmaturia due to the ingestion of an excess of cantharides powder. Plaut[319, Sept. 28] records in his Wurzburg dissertation the production of hæmaturia by experiment after either subcutaneous or intra-peritoneal injection of boracic-acid solution. Cases without any etiological suggestion are mentioned by Giraud[35, May 16] and by Gardner.[282, May] The 2 cases mentioned by the former occurred in children, a boy aged 8 years and a girl aged 9. The case reported from Gardner's clinic occurred in a woman aged 35 years, and was of about one year's duration. No cause was discovered, but, after an exploratory operation, opening the base of the bladder through the vaginal wall, the hæmaturia suddenly ceased and did not recur.

Guyon,[266, Jan.] taking up the subject of the treatment of hæmaturia, divides the phenomenon into these classes—those due to congestion, inflammation, foreign bodies, neoplasms, and traumatism.

Of these classes all save the last are directly connected with congestion, and in each this factor must be recognized and efforts made to overcome it to obtain the fullest value of other medication. In the Central Texas Medical Association, malarial hæmaturia was discussed by a number of members after a paper by Howard.[85 Apr.] The general opinion was averse to the free use of quinine in these cases, the favorite method being the employment of calomel followed by a saline, with some tonic and stimulant medicant and careful diet. Gary[81 Aug.] condemns the use of quinine in these malarial cases, preferring to rely upon calomel and soda or ipecac. When he uses an antipyretic he uses Warbridge's tincture. Tyson[9 Sept.22] presented before his class a young woman suffering from hæmaturia, probably malarial in character. In discussing the treatment of the case he recommended quinine, gallic acid, sulphate of iron, and sulphate of strychnia. The natural astringent mineral waters, such as Rockbridge alum-water, the water of the Bedford Springs of Virginia, are sometimes employed with benefit. He related an instance in which, other treatments having failed, the patient was relieved by the use of electric baths.

HÆMOGLOBINURIA.

The division of hæmoglobinuria into systemic and renal, depending upon a hæmatic cythæmolysis or a solution of the corpuscles within the renal system, is upheld by Lépine,[82 Sept.14] who endeavors to prove the possibility of the latter class by the following experiment. A cannula is inserted into each ureter of a healthy dog, one filled with sterilized water, the other with ammoniacal urine, equal pressure being maintained in each. After three hours the collected urine is drawn from each cannula. In the actual experiment by Lépine the urine from the side in which was sterilized water was normal, while that from the other contained abundant hæmoglobin, but no corpuscular elements. The blood was therefore not broken up in the general circulation, or it had appeared on both sides; nor was it broken up after the urine was secreted, since it is a well-known fact that ammoniacal solutions tend to preserve blood-cells. The disintegration, it is reasoned, must therefore have taken place immediately before entering the tubules—within the tufts or within Bowman's capsules. A systemic cythæmolysis, it is well known, is induced by the introduction of certain substances within the circulation, either by injection or, in case of certain poisons, through internal administration. It has been noticed that there is a marked difference in the intensity of the hæmoglobinæmia and, secondarily, the hæmoglobinuria, glycerin being the injected substance, if that injection be intra-venous or simply subcutaneous. Filehne,[20 Aug.1] seeking to explain this difference, the more intense destruction following a subcutaneous injection into the tissues, holds to the following argument: Every red corpuscle brought into contact with the glycerin solution, whether after diffusion, or after direct contact, contracts, loses some of its water and, of course, some of the salts held in solution in this water. Brought into normal blood or normal serum, it at once swells up beyond its usual size by imbibition of the fluid. As a result its coloring matter is dissolved out. Such condition can only occur when the blood-corpuscles are exposed to two steps—diffusion in the glycerin solution and afterward in normal blood (or serum), as in a localized injection of glycerin. In intra-venous injections this second step is missing, the entire hæmic volume being pervaded rapidly by the injected solution, and only those few corpuscles at the site of injection and at the time of injection could thus traverse the necessary steps for the dissolution of their coloring matter. These views are supported by observations of Filehne upon the blood outside the body in relation to the above steps, and also within the mesenteric vessels of frogs, puppies, and dogs.

Of interest in connection with this question of the manner of production of hæmoglobinuria is the report of Babes[20 Jan.] upon the hæmoglobinuria observed in Roumanian cattle. This investigator ascribes the symptom probably to the activity of a micro-organism, a diplococcus. This form of the condition must, then, be placed in the category of infectious diseases of an endemic occurrence. The diplococcus is to be met within the red blood-cells, not to any extent in the large vessels, but in certain of the parenchymatous organs. It is always found in greatest degree in the kidney, in the tufts. It does not leave the kidney in any great numbers, as a rule, but may be found in the liver and spleen, and occasionally in the vessels. The parasite apparently finds a favorable site for development in the waters of badly-kept wells and ditches, and is taken into the alimentary tract of the animal, thence into the lymphatic circulation and hæmatic system. In close relation with this report stand the recent observations upon Winckel's disease, —acute icterous hæmoglobinuria of the newly-born. Barr and Grandhomme[24 June 9; 1 Mar. 16] publish a case of this affection under the name of hæmaturic bronzing of the newly born. The child, in this instance, became ill on the second day of its life, with convulsive seizures, vomited repeatedly, and refused food. Two days later it presented a yellow and livid appearance, but was without circulatory or respiratory symptoms. The urine stained the napkins in large brownish patches. On the fifth day the child died. At autopsy the color was somewhat faded, but was still visible, and was found to invade not only the integument, but the subdermal cellular tissue as well. Nothing abnormal was found in the lungs or pleuræ. The edge of the mitral valve was thickened and rosy. The liver was stained, but presented no other lesions. Brain was normal save for the jaundice. Spleen was normal in size and stained deeply. The urinary apparatus alone presented important lesions. On section, the kidneys presented a clear line of distinction between the cortex and pyramids, which were deeply stained and marked by reddish lines of injected vessels and of impacted tubules. Under the microscope these tubules were found filled with blood-corpuscles, more or less changed, and greenish pigment-granules. The bladder contained brownish-stained urine, and the mucous membrane was elevated by a small hæmatoma beneath. Beneath the prepuce, about the meatus, was a small clot, brownish red and granular. There was no umbilical lesion. On close examination the granular *débris* in the uriniferous tubules was found to be of broken-down red blood-cells, filling the tubes throughout and into the capsule of Bowman; and on special preparation a large number of bacteria (probably of decomposition) were demonstrable in this mass.

A case even more clearly of micro-organismal origin recently came under the editor's observation by the kindness of Hirst, of the University of Pennsylvania, in which there were demonstrated cocci not only in the kidneys, but in the spleen, liver, and lungs after death, and from the blood of which before death a colony of cocci of identical character was developed.

A case of probable infectious origin is related by Baginsky,[41 Jan. 24] occurring in a child, aged 2 years, who two days after performance of ritual circumcision sickened, developed hæmoglobinuria and jaundice, refused nutrition, presently manifested grave respiratory symptoms, and died.

Of the paroxysmal variety of hæmoglobinuria 10 recorded cases have come within notice. Of these 10 there is a history of syphilis in 3, a distinct neurotic history in 3; the rest, as far as can be deduced from the records, being simple and uncomplicated cases. Bristowe and Copeman $^{2}_{\text{May 4;}}$ $^{6}_{\text{Aug. 10, 17}}$ publish a series of experiments made upon a case of paroxysmal hæmoglobinuria in the person of an omnibus-driver, aged 41 years, affected with syphilis. An extremely interesting and suggestive coincidence in this case was a marked circulatory disturbance of symmetrical occurrence in the second, third, and fourth fingers—Raynaud's disease. This condition was always most marked during the hæmoglobinuric paroxysms. The hæmoglobinuria in this case dated from the winter of 1886–1887. The experiments to which he was subjected consisted in having him walk for periods of varying length in the open air, always well clothed; in holding his hands in cold water, in taking a cold bath, and in variations and combinations of these procedures. Studies of the blood-count before and after the experiments showed a marked diminution, varying from 129,000 to 824,000 per centimetre, after the experiment. This decrease, as a rule, was gradual, not reaching its intensity until several hours after the experiment. The influence upon the urine was noticed in from one-half to three hours after the exposure, and the hæmoglobinuria was invariably accompanied by a slight transitory albuminuria. This was probably to be referred entirely to the dissolution of the red globules, the globulin being in proportion of 2 to 1 to the serum-albumen. The coloring matter of the urine, if determined early, was found to be hæmoglobin, but later it changed to acid hæmatin. The effect of the exposure was always accompanied by fever, ranging in maximum from 99.2° to 103.4° F. (37.33° to 39.66° C.), the maximum being usually attained in from one to two hours after exposure. The attack was almost always of exactly five hours' duration. The replacement of the red blood-corpuscles after their rapid destruction was usually almost as rapid as the destruction. In each attack there occurred a slight icterus. Bruzelius, $^{870}_{\text{Dec., '88}}$ reported by Eklund, of Stockholm, corresponding editor, reports the case of a man, aged 39 years, syphilitic since 1876. Entering the hospital in December of 1886 for treatment of a number of periosteal gummata, he was placed upon internal administration of iodide of potassium. After he was improved, when he walked in the open air it was noticed to bring on an attack of hæmoglobinuria. Before walking the urine was of a pale-yellow color, acid reaction, a specific gravity of 1020, and contained 0.05 per cent. of albumen. After a walk of an hour's duration in the open air he became chilled, and the urine became turbid, brown-colored, of an acid reaction, specific gravity 1020, and contained 0.3 per cent. of albumen. The sediment was large, and contained considerable brownish pigment in granules, some cells more or less broken down, held to a great degree in cylinders of a hyaline material. After treatment for a number of months by mercurial frictions the health of the patient was gradually re-established, but the susceptibility to the action of cold persisted.

Barton$^{2}_{\text{Nov.6}}$ reports a case of hæmoglobinuria in a man aged 39 years, who had malaria in India several years previously, and was tainted with syphilis. The first appearance of the hæmoglobinuria had occurred in India, accompanied by a chill and sweat. During the attacks he complained of shivering sensations and numbness in the feet and legs, gradually extending upward to the trunk and followed by shooting pains in the region of the kidneys. Following these sensations he passed, without pain, dark-colored urine. These attacks usually lasted about six hours, and in the intervals he experienced no symptoms whatever. A specimen of the urine was referred to McMunn for spectroscopic examination, who reported that the color of the urine in this case, as in all other cases of paroxysmal hæmoglobinuria the urine of which he had examined, was due to the presence of methæmoglobin. Rossini$^{497}_{\text{Jan.}}$ mentions 4 cases occurring within his experience, the following 2 of which are noteworthy. A woman affected with glandular and osseous scrofula became the subject of a chronic hæmoglobinuria, of irregular paroxysmal occurrence, varying in duration and intensity. The case finally yielded to constitutional treatment (arsenic, iodide of potassium, and iron). In the second case there occurred hæmoglobinuria *à frigore* in a hysterical patient, the accessions of which always corresponded in duration and intensity with the duration and intensity of exposure. Large doses of quinine did not seem to influence the case one way or another. The other 2 cases reported by this writer were distinctly of paludic origin.

Joseph,$^{4}_{\text{July 1}}$; $^{22}_{\text{July 21}}$ refers to a case of acute circumscribed œdema in connection with paroxysmal hæmoglobinuria in a boy aged 5 years. Two and one-half years before the boy had an attack of acute œdema involving the parts exposed, hands and face; and after this the œdema constantly recurred in cold weather if the child were exposed, but disappeared within ten or fifteen minutes after his return to the house. Last winter, however, a complication presented itself as a paroxysm of hæmoglobinuria. After an attack of shivering, with cold feet, the urine became loaded with hæmoglobin. The following day he was quite well again. The fact that for a year or more the mother had given him, daily, a glass or more of Tokayer, is of some interest in the etiology of the affection. Bastianelli,$^{14}_{\text{July 21}}$ reports a case of hæmoglobinuria brought on by walking, under circumstances in which it was possible to absolutely exclude any influence from cold, and in which case other muscular exercise (as general gymnastics practiced for an hour's time) did not have any influence in its production. Walking, however, invariably provoked it, and there always co-occurred a slight transitory albuminuria. Toralbo,$^{835}_{\text{Aug.}}$ as reported by Meyer, of Naples, Italy, corresponding editor, records a case of paroxysmal hæmoglobinuria. The writer looks upon the affection as in some way dependent upon fault of the nervous system.

The malarial form of hæmoglobinuria has received but little attention during the past year, the few cases of malarial origin being regarded by the writers as hæmaturic in character. It is questionable whether this classification is proper, in all these cases there occurring undoubtedly some degree of hæmoglobinuria along with the appearance of corpuscular *débris*, and corpuscles from which all coloring matter has been removed. It is probable that in these cases it is possible to distinguish two separate forms: one which the hæmatic dissolution occurs in the systemic circulation, in which the corpuscular *débris* is completely broken up in the liver and spleen before being thrown out of the economy, and another form in which there is especial renal involvement leading to renal hyperæmia and the dissolution of the hæmatic elements in the renal system. In either case hæmoglobin is present, and the condition should probably be spoken of as a hæmoglobinuria; although in the latter class there is added that which has led some observers to speak of the condition as a hæmaturia—corpuscular *débris.* In this edition of the ANNUAL, however, the classification of the writers is maintained, and the conditions described in the various journals as malarial hæmaturia are considered under that head.

Stamps[229, Dec.,'88] is quoted as upholding the ideas of Burggraeve as to the methods of therapy in cases of malarial hæmoglobinuria. He commends the use of atropia and strychnia as a basis of treatment, the atropia as a tonic to the circulatory system, and strychnia as an adjuvant. The rest of the treatment is symptomatic.

GLYCOSURIA.

The relation of this symptom to lipomatosis is illustrated in the records of 4 cases mentioned by Kisch,[57, Dec.22,'88] who regards cases of marked lipomatosis of hereditary nature as especially predisposed to diabetes. Moritz,[34, Apr.16] experimenting with Fischer's phenyl-hydrazin test for glucose, is led to the conclusion that a small quantity of this substance is normally present in human urine. He is able to obtain the characteristic forms of crystallization, having the proper degree of melting-point, in the urine of persons in whom other tests entirely failed. This result seems, in his experience, to be quite constant, and the writer regards this evidence, unless there be proved to be some other substance in urine capable of acting upon the reagent (possibly some member of the aromatic group), as indicating a physiological variety of glycosuria. In carrying out these experiments, Moritz lays some stress upon the necessarily large proportion of urine required to give evidence of the presence of sugar, using 5 grammes (77 grains) of phenyl-hydrazin hydrochloride, 10 grammes (154 grains) of the acetate of soda, and 100 cubic centimetres (3.38 fluidounces) of urine. Germain Sée,[2, June 1] employing phenyl hydrazin as his test-reagent, concludes that in 16 or 17 per cent. of healthy persons the urine contains sugar in small amount,—0.033 milligramme (½ grain) in 100 cubic centimetres (3.38 fluidounces) of urine,—although it would appear that this authority regards these individuals as more or less disposed to the development of true diabetic glycosuria. Swift,[1, Feb.23] while recognizing a form of glycosuria as distinct from diabetes, would not accept it as a physiological variety, and suggests that these cases may really represent an early stage of diabetes mellitus, and that, while differences do exist, and therapeutic and dietetic measures are of value in the condition, later they may be of no use whatever. The same writer calls attention to the rather frequent occurrence of glycosuria in women during pregnancy and lactation.

Hagar's Preliminary Test.—This is a simple and ready method for preliminary or bedside examination. Upon a strip of white filter-paper a single drop of urine is placed and carefully heated to dryness. If no sugar be present the color of the spot will be quite pale or faintly yellow; if albumen be present the stain will present a deeper yellow hue; while if sugar be present a yellow color with a brownish shade will be manifest, and, under a magnifying glass, by transmitted light it will be noticed that at the edges the spot will show darker spots,—normal urine preserving a more uniformly colored stain. [41 Feb.25; 107 July 15]

Safranine Test.—Grismer [293 Mar.; 90 June] suggests that this test be performed as follows: One cubic centimetre of urine should be boiled with 5 cubic centimetres (1.35 fluidrachms) of a solution of safranine (1 to 1000) and 2 cubic centimetres (32.46 minims) of a solution of caustic potash (10 per cent.). If sugar be present the solution will be decolorized; but on cooling will become turbid. Crismes [67 June 15; 25 Aug.] performs the test in this manner: Ten grains of safranine are dissolved in 100 cubic centimetres (3.38 fluidounces) of water. A few drops of the urine, or of a solution of glucose, are introduced into 2 or 3 cubic centimetres (32.46 or 49 minims) of the safranine solution and an equal amount of a 10-per-cent. solution of caustic soda added. The whole is then warmed to 60 ° C. (140 ° F.), and in the presence of glucose the safranine is reduced, forming a colorless solution which when cold precipitates. After a lapse of time the color of the safranine is restored by the oxygen of the air. Safranine is a coloring agent belonging to a group obtained by the oxidation of the nitric derivatives of toluidine. Its special value as a test-agent for glucose rests upon the fact that its solution is not decolorized by uric acid, creatinine, chloral, hydrogen peroxide, or the salts of hydroxylamine,—all of which possess reducing power over the copper reagents. Albumen, however, decolorizes it, but only very slowly and after a length of time. Sometimes, too, urine that is apparently normal will act similarly, but according to Grismer there is a likelihood that these urines actually contain small quantities of glucose, since upon fermentation bubbles of CO_2

arise, and after this no further decolorization can be noticed in using the safranine test.

Fehling's Test.—Yvon and Berlioz $^{100}_{\text{June 30}}$ conclude that for clinical purposes Fehling's solution affords the best facilities. It is pointed out by these observers that, if after the usual methods of examination the urine remains clear, sugar is certainly not present; but where there is any evidence of reduction at all, doubt exists. Under these circumstances they recommend that the urine should be added in double proportion to the Fehling's solution and boiled, when, if sugar be present, a slight yellowish coat will form on the sides of the tube; perhaps even three or four times as much urine as Fehling's solution must be employed where the glucose is present in very minute amount. These authors do not regard Fischer's phenyl-hydrazin test as above doubt, having obtained the characteristic reaction where sugar was entirely absent.

Cyanide Test.—Gaube $^{73}_{\text{July 7}}$ proposes, as a delicate reagent for glucose in urine, the following modification of Gentile's reagent:—

℞	Ferrocyanide of sodium (c. p.), ...	1
	Saturated solution of sodium hydrate, ...	20
	Distilled water, ...	2000

One grain of the freshly-prepared reagent is decolorized by 0.00015 gramme (0.0023 grain) of glucose. Employing this delicate reagent, Gaube has examined numerous specimens of apparently normal urine, and concludes that sugar is normally present: in children, 1 gramme (15.43 grains) per 1000 cubic centimetres (2.11 pints); in adults, 0.7 gramme (10.30 grains); and in age, 0.8 gramme (12.34 grains).

Robert's Differential Density Method (*Budde* $^{88}_{\text{B.12,p.236}}$).—Roberts, some time since, proposed this method in which the difference of density of the urine before and after fermentation is to be multiplied by an experimentally-found factor, 230. Other experimenters, however, propose changes in this factor varying from 218 to 263, corresponding to a considerable variation in the amount of sugar determined.

Other Reducing Substances.—The combination of the fermentation test and Fehling's is suggested by Worm-Müller (*ibid.*) as a means of estimating the amount of reducing substances in the urine other than sugar, first breaking up the sugar by fermentation and then subjecting the urine to Fehling's method.

Gaube,$^{3}_{\text{June 5}}$ studying the reducing bodies in the urine of oxycrasia, states the following conclusions: In infantile urine the substance having reduction power over the potassio-cupric solutions is a volatile body having a peculiar odor, and possessing a reducing power also upon the salts of silver, combining with the alkaline bisulphites, and being freed from such combination in the presence of acids. It is apparently an aldehyde. In acetonæmia and acetonuria the acidity of the urine of these oxycrasiac cases is due to the acid salts of lactic and phosphoric acids, usually in combination with potassium. In other conditions than acetonæmia the acidity of urine in these cases is due usually to the acid salts of uric and phosphoric acids in combination with the alkalies and alkaline earths. Lactose may be found in these urines, and can be made apparent by the use of sugar of lead and ammonia. Wedensky,$^{83}_{\text{D.13,p.123}}$ following the method of Baumann, has made a study of the carbohydrates in the urine. To 200 cubic centimetres (6.76 fluidounces) of freshly-voided urine a small quantity of soda is added, and the liquid filtered to remove the phosphates. To the filtrate 25 or 30 cubic centimetres (6.76 fluidrachms or 1 fluidounce) of a 10-per-cent. solution of soda and 5 cubic centimetres (1.35 fluidrachms) of the chloride of benzoyl. A crystalline precipitate results, which is washed upon the filter until the alkaline reaction of the filtrate is changed to a slightly acid one. The quantity of the precipitate, which is a combination of carbohydrate and benzoyl, varies in individuals and at different hours in the same person. According to Wedensky, the highest figures may vary between 0.138 and 0.130 gramme (2.13 and 2 grains) per 100 cubic centimetres (3.38 fluidounces) of urine. This substance contains no nitrogen, but shows constant quantities of carbon (66.88 per cent.) and hydrogen (5.51 per cent.), representing the mean given by glycogen or dextrine and glucose. Wedensky further shows that the substance is, in reality, a mixture of two carbohydrates, one corresponding with dextrine, the other with glucose. These are readily separated by boiling with a soda solution. The benzoyl compound with dextrine or glycogen is rapidly broken up, while that with glucose is not decomposed except after prolonged boiling. The former, having in this manner been separated, is collected on a filter, and may be redissolved in alcohol. This alcoholic solution, upon the addition of soda, will reduce

Fehling's solution, boiled with the latter directly, or after having been heated to the boiling-point with sulphuric acid. In this latter case benzoic acid would be separated, and could be removed by the employment of ether; in the aqueous solution there remains a carbohydrate having all the characteristics of grape-sugar, reducing Fehling's reagent and forming anew, upon the addition of chloride of benzoyl, a benzoic ether. The permanence of this ether in the presence of alkalies, its ready decomposition in acids, differentiate this form of carbohydrate, and would point it out as a compound of glucose. The substance which was dissolved out by the soda solution from the mixture is a member of the dextrine group, and does not directly reduce Fehling's solution; but after being boiled with sulphuric acid it acquires this property. With sulphate of copper it forms a flocculent precipitate, which, washed, dried, and dissolved in muriatic acid, gives, upon the addition of alcohol and elevation of the temperature to 60° C. (140° F.), a marked flocculent precipitate of the carbohydrate itself. This latter reaction accords with that given by Landwehr, as characteristic of the group of dextrines known as "animal gum." Albertoni[276, Aug. 30] has recently communicated the case of a woman aged 50 years, in good health, whose urine had presented a peculiar gummy consistency for years. The urine had a peculiar aromatic odor, and did not putrefy even in a warm temperature. The writer believes the special property of this urine to be due to a substance like that mentioned above, and described by Landwehr as animal gum. It is precipitated from the urine by the addition of absolute alcohol, or cupric sulphate and an excess of sodium hydrate, and may be collected upon a filter and washed. Thus separated it is not soluble in distilled water, except after acidulating slightly with muriatic or sulphuric acid. This aqueous solution, if treated with Millon's reagent, gives an intense yellow color, but does not turn red upon boiling; and the substance may be precipitated from the watery solution in the same manner as from the urine. With Udranski's furfurol reagent or Baumann's chloride of benzoyl, it gives the reactions of a carbohydrate. Submitting this urine to a bacteriological examination, Malerba and Sanna-Salaris found that it contained a micro-organism somewhat like the typhoid bacillus in its fullest development, and inoculations of ordinary urine with it caused the same gummy appearance to develop. Filtering this experimental urine through a Chamberland's filter, Albertoni found that the filtrate possessed the property of causing the peculiar mucoid property in normal urine. It is therefore concluded that this animal gum is produced in urine by the action of some micro-organismal product.

Pyrocatechinuria.—Magni[616, Apr. 6] describes a case of this rather rare condition in a young man. With Trommer's reagent the urine gave a result apparently indicating a large amount of sugar; however, there was no deflection of the ray of light upon polarizing since pyrocatechin is optically inactive. The urine was strongly acid, free from albumen, and had a specific gravity of 1027. Upon the addition of an alkali a brown color was assumed, as also if the urine stood for any length of time in the air. Treated with an ammoniacal solution of silver in the cold it caused reduction, and in the warm caused the separation of free silver. Differing from glucose, it did not, however, respond to the bismuth test; with chloride of iron it was marked by the production of a green color.

Acetonuria, etc.—Schrack,[54, Oct. 1] writing from the pædriatic clinic of von Jaksch of acetonuria and diaceturia in children, states that the former occurs not infrequently in children, especially in febrile affections and in acute gastro-intestinal derangements. It may, however, be absent even in high and continuous pyrexia. Diaceturia, likewise, is quite frequent in children, and is almost constant in high and continued fever; and is quite common in the acute infectious processes, even if there be but little attendant fever,—as, too, is the case with acetonuria.

Chantard's Reagent for Acetone.—Romme[1157; 25, Feb.] recommends, as a reliable test for the presence of acetone in the urine, a solution of fuchsine (1 to 2000) into which a current of sulphurous-acid gas has been passed, rapidly decolorizing the liquid and causing it to assume a clear-yellow tint, which is permanent and unaffected by an excess of acid. A few drops of such a solution added to a urine containing acetone produce a deep-violet color, the test being delicate enough to detect 1 part of acetone in 1000 of urine.

Perchloride of iron is not a test for acetone, but for diacetic acid, an unstable compound easily splitting up into acetone, alcohol, and carbonic acid. Brief *résumés*[556, Feb. 15; 61, Mar. 9] of the methods employed for the detection of these substances are published.

Choluria.—Oliver[1158; 25, Oct.] describes a physiological test for bile in the urine depending upon the fact that the bile-salts precipitate the peptones from solution. The precipitate produced by urine containing bile-salts in a peptone solution acidulated with acetic acid is soluble in acetic or citric acid, thus differing from all other precipitates in the urine produced by acidulated reagents. Further, the precipitate may only be partially cleared up by heat. The writer also proposes a quantitative application of the same principle.

Modigliano,[376 Dec.,'89, 90 July] when urine is deeply colored by bile-pigments masking the quantitative estimation methods for the chlorides, phosphates, sulphates, etc., recommends the following method for decolorizing: To each cubic centimetre of urine add 2 drops of nitric acid and afterward 2 drops of a 4-per-cent. solution of potassium permanganate. The test-tube is agitated for several minutes, the urine becoming colorless and clear. (If, however, the turbidity persist, the liquid should be filtered.) To estimate the chlorides by the nitrate of silver and neutral potassium-chromate process, the urine should be diluted and ammonia added to decrease the acidity. The ammonium-molybdate method for the estimation of the phosphates requires no change in the fluid, but the uranium-acetate method requires that the acidity be lessened by the addition of a little ammonia. In order to redissolve any phosphates which may have been precipitated by this last measure a small amount of acetic acid should then be added. When the sulphates are to be estimated, instead of nitric acid, muriatic acid should be employed in the decolorizing, and then barium chloride used as usual.

Chyluria.—Solis-Cohen[760 May 18] records a case of irregularly intermitting chyluria in a boy aged 16 years, a native of the island of St. Thomas. The disease was first noticed four years ago, when it lasted several weeks, then disappearing until 1889. The chylous urine was carefully examined, but neither in it nor in the blood was any trace of parasites determined. The physical characteristics were those of chylous urine generally. The peculiar condition disappeared as suddenly as it came and as spontaneously, the treatment at the time being of the nature of a placebo. Lucas[2 May 4] publishes the notes of the case of a young woman suffering with chyluria associated with a marked lumbar swelling. A small swelling had been noticed in the lumbar region at the time of her birth, which had since increased to the size of a child's head. When 7 years old it was remarked that the urine became at times thick and milky. The swelling was associated with an extensive nævus on the posterior portion of the thigh, had a distinct bruit, and was regarded by the writer as probably of nævoid character. It is possible that some connection existed between the swelling and the lymphatics about the kidney. Upon cystoscopic examination chylous urine could be seen coming from the right ureter, the side upon which the appearances noted existed. No parasites could ever be discovered. A peculiar case of hæmato-chyluria is reported from Desmeth's clinic.$^{6}_{\text{Feb.}}$ The patient was a young man aged about 30 years, who attributed his condition to a chill. At first he suffered from pain in the epigastrium, this being followed by vesical tenesmus, causing a very frequent micturition. The urine was quite milky, and upon standing formed a solid clot. This was the third attack of the affection from which he had suffered. His general health was quite fair. After admission it was found that the character of the urine varied very much, being at times red and forming a solid clot, again milky, with little or no red tinge, and occasionally apparently normal. Sometimes these conditions followed each other in regular order, but not always. Under the microscope the epithelial elements were found to be no more than normal; there never were any casts. Further, there never were noted any white blood-corpuscles, the color and opacity of the urine being entirely due to the presence of red cells and finely-emulsified fat. Diet appeared to have no influence upon the case, and the attacks of chyluria seemed to have no relation to meal-times. Sigmund,$^{6}_{\text{Feb.}}$ has reported a case of some similarity where a fistula existed between the lacteals and the bladder, but it is questionable whether the etiology is identical. In neither of these cases were parasites found, either in blood or in urine.

Cystinuria.—In the etiology of this affection, the observations of Baumann$^{1159}_{\text{B.21,p.2744;}}$$^{83}_{\text{B.5,p.309; B.8,p.302; B.9,p.206; B.12,p.254}}$ are probably the best known. He, in conjunction with Goldmann, found that cystin, or some similar compound, occurs as a normal metabolite in man. From the urine and fæces of patients suffering from this condition Baumann has been able to obtain, besides cystin, a number of ptomaines, as cadaverin, putrescin, and a diamine isomeric with cadaverin, which may questionably be either neuridin or saprin.

According to Brieger's investigations, the diamines are to be found only in case of certain forms of putrefaction from the action of certain micro-organisms. Normal urine and fæces do not contain any diamines, and the existence of cystinuria apparently is connected with a special form of intestinal mycosis, the affection being then rather a phenomenon in the course of an infectious malady than a constitutional fault (Stadthagen and Brieger). Following the line of work of Baumann's investigations, Stadthagen and Brieger$^{4}_{\text{Apr.25}}$ have studied 2 cases of cystinuria. The presence of pentamethylene diamine was determined in both cases, but whether the diamines were constantly or only periodically present could not be concluded. The co-existence of vesical catarrh in one of these cases and in Baumann's case, with the cystinuria and diaminuria, suggested that the diamines were secondary to such a catarrh of the bladder. The other case, however, of these two observers was without any symptoms of cystitis; and in ordinary cases of vesicle inflammation there are never any of the diamines. Another point of interest in these cases is the fact that in Baumann's case three forms of diamine were isolated, while in neither of these two could more than the single one be determined. From the points suggested by the study of these cases, Brieger concludes that in these cases the diamines are formed in the intestinal canal, and that the cystin here unites with them as an acid radicle. When this compound is brought into contact with the acid urine it is decomposed, and the cystin, insoluble in water, is precipitated; while the diamines, being of an irritative nature, sooner or later cause some inflammatory processes in the urinary tract.

Leo$^{114}_{\text{B.16,H.3,4}}$; $^{4}_{\text{July 29}}$ has recorded a case occurring in a female aged 41 years, who for some years had had periodic attacks of renal colic. The urine was usually turbid and alkaline in reaction, although Leo suggests that the extremely rapid changes after passage might account for the latter feature. In the sediment the characteristic crystals were to be seen. The author made certain investigations as to the relation to this condition and increased tissue metabolism from exercise, from which it would seem that the quantity of the cystin is not influenced by such factors. Another case, occurring in a man aged 58 years, is described by Czapek,$^{88}_{\text{Dec.12,'88}}$ the general characteristics of the urine being a slight turbidity, acid reaction, and normal gravity and quantity.

UREA.

From recent experiments, Gerhard and Quinquaud,[3, May 29] studying the amounts of urea in muscle and the blood, would conclude that this substance is formed in the former tissue rather than in the latter. In 100 grammes (3 ounces 2 drachms) of blood they obtained 35 milligrammes (0.54 grain) of urea, while from an equal amount of muscle their results indicated 37 milligrammes (0.57 grain).

The mooted point as to the urea excretion in morbid conditions, marked by the growth of malignant neoplasms, particularly cancers, has been the subject of a valuable thesis by Rauzier.[1160; 17, Oct. 19] The bulk of opinion in this question has favored the idea that the decrease of nitrogenous excretion noted in these cases depends primarily upon the state of inanition induced by the new formation; there have been those, however, as Rommelaere, of Belgium, who regard this decrease as due directly to the neoplasm, either on account of the seat of the growth or its inherent malignancy. Rauzier, after a large number of careful observations, has arrived at conclusions which, from the exhaustiveness of his inquiry, would seem to be decisive. The malignant tumors invariably, no matter their site, are accompanied secondarily by a lowering of organic nutrition and the assimilative functions. As a result of this there is a decrease in the nitrogenous excretion in the urine, the amount of which would, graphically expressed, run parallel with the secondary infection of the organism. The hypoazoturia is thus the more early and more marked, the more general and rapid is the nutritive alteration, and is hence particularly encountered in cancer; it is late in the course, on the contrary, of those tumors which remain localized for a long time in seats beyond the nutritive organs, as is the case with many epitheliomata. It is, therefore, only met in advanced cases of malignant growths, where their nature can scarcely be longer doubted, but might be of service in the rendering of a diagnosis in such gastric cases where one hesitates between ulcer and cancer. In tumors of the abdomen the frequency of this condition of hypoazoturia is marked if there be present an element of malignancy; but in case of cancers of other regions its presence depends entirely upon the period of the case and the secondary alteration of nutrition. At the beginning of the affection, the only time when successful interference is probable, the symptom is absent; and, further, it must be remembered that its presence, coincident with renal alterations, ascites, or tuberculosis, might be explained by such conditions.

Estimation of Urea.—Gautrelet,[24, Jan. 27] describes at length an apparatus intended for this purpose, which does not, however, differ in any important details from several other instruments used in the hypobromite method. It consists essentially of three parts: a gas-generator; a test-tube graduated for 10 and 35 cubic centimetres (2.71 fluidrachms and 1.18 fluidounces), and fitted with a rubber stopper; and a gasometer of 85 cubic centimetres (2.88 fluidounces) capacity (a long glass tube open at both ends, graduated into cubic centimetres and fractional parts, and having at its upper end a small chamber fitted with stop-cocks to close communication with the graduated portion of the tube and the external air). Communication with the generator is made through this chamber by means of a rubber tube. The third part of the apparatus is a small glass chamber attached to the lower end of the gasometer by a long rubber tube. In the application, the last is partially filled with mercury; the gasometer is filled with the same substance to the upper portion of the graduated scale (0), and the level of the mercury maintained in the two portions of the apparatus. The gas-generator is then filled to the 35 cubic centimetres (1.18 fluidounces) mark with hypobromite of soda solution, and 10 cubic centimetres (2.71 fluidrachms) of a 5-per-cent. solution are added. In the generator a small test-tube containing urine (5 or 10 cubic centimetres—1.35 or 2.71 fluidrachms) is placed, and the connection with the gasometer made. The generating tube is then tilted until the urine runs out of the inner test-tube upon the hypobromite solution. The cock opened, the nitrogen evolved passes over into the gasometer (the CO_2 being absorbed by the excess of alkali provided in the hypobromite solution) and is measured. The usual calculations from the amount of nitrogen suffice to give the amount and percentage quantity of urea, remembering that this quantity represents the total nitrogen of the urine, from which, by further procedure, must be deducted that evolved from the uric and creatinin (*quod vide*).

Quantitative Estimation by Phosphoric Acid.—Bleibtreu[246, B. 44, p. 512] has recently been estimating the urea in the urine of dogs by this method. The procedure is based upon the fact that it is possible to precipitate all the extractive matters of the urine by a mixture of hydrochloric and phosphotungstic acids. The urine filtered, it is neutralized by adding a bit of powdered calcium carbonate and again filtered. The liquid having been heated to 230° or 260° C. (446° or 500° F.) with crystals of phosphoric acid for three hours, the urea is broken up and forms ammonia, a transformation which the other azotized substances do not undergo. The ammonia unites with the phosphoric acid, is distilled with bicarbonate of sodium solution, and estimated by titration. The author states that the method may be used in the estimation of urea in the human urine, especially where the alimentation is largely nitrogenous.

URIC-ACID DIATHESIS.

The first synthetic production of uric acids was performed by Horbaczewski by heating together glycocol or trichlorolactic acid and urea. Uric acid under these circumstances is formed at an elevated temperature by an extremely complicated reaction, and only in small amount; it, however, responds to the characteristic features and reactions of uric acid. The production of the substance from a derivation of lactic acid was particularly interesting in that it afforded an explanation of its formation in the organism. Recently, Berend and Roosen[836, B.251,p.236] have succeeded in obtaining it from isobarbaturic acid, a substance discovered by one of these investigators. This acid is obtained in the following manner: Urea is acted upon by acetylacetic acid; there result water and uramidocrotonic ether. This, boiled with a solution of potash, is changed into methyluracil. This last, transformed by nitric acid into nitrouracil-carbonic acid, when it is heated to 40° C. (284° F.) with water, loses its carbonic acid and becomes nitro-uracil. This, reduced by zinc and hydrochloric acid, produces isobarbituric acid. Isobarbituric acid may be regarded as a ureide of oxypyruvic acid or a ureide of α-β dioxyacrylic acid. Oxidized, it is transformed into an isomer of dialuric acid. This isodialuric acid, if heated to 100° C. (212° F.), with one molecule of urea and seven times its weight of sulphuric acid, produces uric acid corresponding in every particular with the ordinary uric acid.

In consideration of this condition, probably the greatest interest centres upon this question of the mode of origin in the organism; but one other feature bears almost an identical importance,—that of its most thorough elimination.

Draper,[1]$_{\text{Oct. 12}}$ in a paper of clinical interest, in which he confirms the views of Haig, indicates that deposits of uric acid and its compounds in urine do not necessarily mean any considerable increase in their formation, as they do a condition of the blood affecting the solubility and the excretion of these substances. This hæmatic condition is one of diminished alkalinity, produced by the entrance of acids into the circulation formed in the alimentary canal, or by imperfect conversion by the liver of the saccharine and farinaceous elements of the food. In the discussion of this paper, *à propos* of Draper's view of the origin of the symptom as secondary to the consumption but imperfect conversion of saccharine matter, it was pointed out by Polk that the uric-acid diathesis and its congener, gout, are quite rare diseases among the negroes of the lower portions of the Southern States, in the sugar regions, in spite of the fact that their diet is in certain seasons almost limited to saccharines. Continuing his interesting observations of last year upon the nature of the diathesis, Haig[2]$_{\text{Feb. 9}}$ has devoted his attention to the manner of production of certain results of this condition. It is the opinion of this writer that the presence of uric acid in the blood in any excess influences directly the arterial tension, increasing it (apparently by direct action upon the vessels, from the general drift of the writer's remarks). This heightened arterial pressure Haig has been able to produce at will by the production of an "alkaline blood-wave." Briefly, the theory upon which are based these observations is that uric acid is not influenced by dietary or medication in its formation, that being regarded as constant and uniform with the production of urea (1 to 33). As a substance insoluble in acid media, uric acid, when the blood and fluids of the tissues decrease in alkalinity, is no longer held in solution by these liquids and thus carried through the renal system, but is deposited in the organism, largely in the liver and spleen. If for any reason this decreased alkalinity be overcome and a wave of increased alkalinity induced, as by the administration of alkalies, these deposits are redissolved and carried in the current, producing an excess in actual circulation. Under these circumstances, Haig has demonstrated the existence of an increased arterial tension; and a confirmatory evidence is the fact that with these periods of increased tension there exists increased uric-acid excretion. This increased vascular pressure, further, is demonstrably most marked during the alkaline tide of digestion, after breakfast in the morning, in the afternoon from 3 to 6 o'clock, and again in the evening about 9 or 10 o'clock. Extending the limits of his theory, and citing Liveling as justifying his position, the author attributes to this high tension the headaches which accompany the crises of this affection, and fits of mental depression and melancholia so frequent in uric-acid diathesis, quoting Broadbent's Croonian lectures in support. As evidence of the correctness of his reasoning, that these conditions are due not to the constitution of the blood, but to its pressure, the author cites the influence of violent exercise or of a Turkish bath, measures which, to his mind, are apt to lower the blood-pressure by general relaxation without specially influencing the amount of uric acid in the circulation.

D'Estrées,[211, Feb.10] discussing the relations of oxaluria to uric-acid diathesis, attributes the former to an imperfect oxidation of uric acid formed from the nitrogenous nutritive elements. According to the author, this change is in some way dependent upon the nervous system. He points out the relatively more frequent occurrence of oxaluria in Americans and the predominance of the uric-acid diathesis in Europeans (particularly the French). This national tendency of Americans to oxaluria the writer attributes to the excessive nervous energy displayed by this nationality.

The views of Haig as to the non-importance of diet as influencing the formation of uric acid find some confirmation in the experiments of Spilker, studying the influence of the alkalies upon the uric-acid excretion. Salkowski and Spilker,[20, Sept.] as a result of these experiments, evidently regard uric acid as formed rather from the albumens of the organism than from those of the food-stuffs or from fault in the metabolism of these last. In these experiments, Spilker studied the administration of alkalies, both upon himself and a dog. In the former case the excretion of uric acid was decidedly lowered, while in the latter it was markedly increased. Side by side with these observations upon the dog, Taniguti[20, Sept.] studied the influence of the alkaline administration upon oxidation in the organism. The dog was especially selected for these observations in that the oxidation of the sulphur compounds is easily studied, sulphur existing in canine urine in the form of sulphates (oxidized sulphur) and in an organic but unstudied body as free sulphur. Observations upon the relations of the sulphate and free sulphur in this case showed a decrease in the amount of sulphates and a slight increase in the free sulphur, indicating that rather than aiding in the oxidation processes alkalies retarded them. Taniguti's results correspond in this respect with those of Auerbach obtained in the study of the oxidation of phenol in the economy. Taniguti suggests that the increase of uric acid observed in the parallel experiments in the same animal may, in reality, be confirmatory to his own results, being possibly the results of diminished oxidation. It is possible that the difference noted by Spilker in the action of the alkalies upon the excretion of uric acid in man and in the dog depend upon the difference of nature of these organisms, the latter being carnivorous, the former, at least to a certain extent, herbivorous. Estimations of the uric acid in urine of herbivora, made by the Salkowski-Ludwig method,$^{83}_{\text{B.12,p.464,'88}}$ varied between 8.8 and 45.3 milligrammes (0.124 grain and 0.695 grain) per 100 cubic centimetres (3.38 fluidounces) of urine; in hogs the variation amounted to 3.5 to 33.5 milligrammes (0.054 to 0.51 grain) per 100 cubic centimetres (3.38 fluidounces) of urine.

In the therapy of this condition, Haig,$^{2}_{\text{June 1}}$ refers to the well-known solvent action of phosphate of sodium upon uric acid. While, however, its administration increases the excretion of this substance, all specimens of the salt do not act equally well. The most specimens seem to contain small amounts of the sulphate of sodium, which diminishes its activity. Under administration of the pure phosphate, Haig states that it is his experience that a constant and uniform increase in the uric-acid excretion is to be noted, and that its power of solubility seems somewhat increased by the additon of a small amount of carbonate of sodium. The use of this salt seems to be limited to the chronic cases of the diathesis, its alkalinity being scarcely sufficiently marked to counteract the excessive acidity in an outburst of gout. In his article upon mental depression in the uric-acid diathesis, Haig$^{15}_{\text{Nov.,'88}}$ resolves the treatment of this condition into prevention of an excess of the acid in the blood by the employment of drugs and by diet. Regarding it due to too great solution of uric acid in the blood, the immediate indication, according to this gentleman's theory,—and it is well borne out in practice,—is the administration of acids to procure the precipitation of the noxious substance out of the circulation. In most cases this is readily accomplished, and marked benefit may often be obtained in a comparatively short while. Where, however, there is gastro-intestinal disturbance, absorption of the acid may be delayed for hours and the anticipated results postponed. Temporary relief being obtained, the dietary is to be arranged so that future excess of uric acid shall not be retained and that its excretion be fully accomplished. To this end it is necessary to prevent the decrease in alkalinity which permits the deposition of the acid in quantities in the organs and tissues (this excess in the tissues being taken up by any temporary increase in the alkalinity and causing gouty paroxysms and paroxysms of mental depression). This is best accomplished by cutting off, as much as possible, meats, saccharine articles, beers, wines, etc., and reducing the diet as much as possible to milk, fruit, vegetables, and fats—as butter. Draper$^{1}_{\text{Oct. 12}}$ advises as the best dietary in cases of uric-acid diathesis of the usual form, one from which the withdrawal of non-nitrogenous food is more or less complete, relying mostly upon the presence of meats,—a procedure opposite to that advised by Haig, but probably explicable upon the same theory as the latter.

Johnson,$^{141;}{}^{39}_{\text{Jan. 1}}$ in speaking of the treatment of the brick-dust sediment, refers it to a hepatic origin, and devotes considerable attention to the use of the saline mineral waters. He insists on the use of these waters as hot as can be comfortably drunk, thus avoiding a most common mistake in the employment of these remedies, and obtaining the fullest results not only from the saline materials, but from the general vascular and excretive stimulation from the warm draught. The writer regards as most valuable the Hunyadi Janos water (containing 2½ drachms each of sodium and magnesium sulphate to the pint), the Püllna, and Friedrichshalle. Durand-Fardel,$^{3}_{\text{Jan. 30}}$ from the action of the warm mineral waters in the uric-acid diathesis, divides them into three classes: (1) bicarbonate of potassium waters, (2) sulphate and bicarbonate of lime waters, and (3) a middle class. The sulphate and bicarbonate of calcium waters, Contrexéville, Vittel, Martigny, and Heucheloup, act directly upon the urinary tract by the large amounts in which they are usually taken, and to a certain extent act on the excreting surface. They find their best indications where there exists in the kidneys a permanent pathological condition rendering the secretion of urine more or less difficult, as in the case of calculus or of catarrh of the tubules. The bicarbonate of sodium waters, as Vichy or Vals, on the contrary, may be said to prevent the formation of calculi. They possess considerable curative effect, acting not to the solution of the calculi entirely, but aiding in some way the tissues to expel such concretions. Where there is any irritability, the least inflammatory element, they are contra-indicated. The other class finds its best uses not in the uric-acid diathesis directly, but in the catarrhs of the urinary tract, whatever their origin, especially where there is pain associated. Among these the author mentions the waters of Capvern, Preste, and Pougues.

Le Clercq,[1, Feb. 2] reviewing the use of Carlsbad water in the uric-acid diathesis, publishes the results of a number of observations upon himself, from which he concludes that these waters possess little or no power to produce actual decrease in the excretion of uric acid. He regards the well-recognized therapeutic value of the waters as probably explicable by supposing that, because of the warmth, these liquids readily diffuse and thus hasten the excretions, and, further, that they really possess direct stimulating action upon the liver and stomach.

ESTIMATION OF URIC ACID.

Haycraft's Method.—Hermann[83, B.12, p.496, '88] employs this method as follows: Twenty-five cubic centimetres of urine are rendered alkaline with about 1 grain of sodium bicarbonate and a small amount of ammonia. To this alkaline solution is added an ammoniacal solution of silver until precipitation has ceased, and the precipitate collected upon an asbestos filter and washed free from silver. It is then dissolved in a 20- to 30-per-cent. solution of nitric acid. In this solution the silver compound is treated after Volhard's method with a 1-per-cent. solution of rhodium. Each cubic centimetre (16.23 minims) required of this last, multiplied by 0.00168, gives the quantity of uric acid contained in the 25 cubic centimetres (6.76 fluidrachms) of urine employed. Hermann, after comparing this with the Salkowski-Ludwig method, commends it highly, the difference in results being of little importance. The method is not influenced by the presence of sugar or albumen.

Gautrelet's Volumetric Method.—This writer[24, Jan. 27] suggests the following modification of the Huffner-LaSource method for the estimation of the uric acid. Employing a sufficient quantity of urine, the total amount of nitrogen is estimated by means of the azotometer before mentioned. From another quantity of urine, by means of the basic acetate of lead, the uric acid is completely separated, and this is again subjected to estimation for nitrogen, which in this case represents only the urea and creatinin. In order that the nitrogen of the uric acid be completely evolved, the writer employs a concentrated hypobromite solution, made up of bromine, 15 cubic centimetres (4.06 fluidrachms); soda solution, 135 cubic centimetres (4.56 fluidounces); and water, 50 cubic centimetres (1.69 fluidounces). In the manipulation he advises that a small amount of sugar solution be added, and that 5 or 10 cubic centimetres (1.35 or 2.70 fluidrachms) of urine be employed. The difference in results in these two estimations represents the nitrogen of the uric acid, from which the amount of the uric acid may be calculated.

Sulphate of Copper Method.—Arthaud and Butte[3 Sept.11] base a new method for the quantitative estimation of uric acid upon the fact that it forms with a copper salt an insoluble urate. They recommend for the purpose the following solution:—

℞ Sulphate of copper, . .	1.484	grammes (22.50 grains).
Hyposulphite of sodium, .	20.	grammes (808. grains).
Sodium and potassium tartrate,	40.	grammes (1 oz. 2 dr. 17 gr.).
Distilled water, enough to make 1000 cubic centimetres (2 pints).		

In contact with the hyposulphite the cupric salt is changed into a cuprous salt, remaining in that state in an excess of the hyposulphite. The Rochelle salt aids in keeping the solution fixed and in preventing the separation of the sulphur. The quantity of cupric sulphate (1.484 grammes—22.50 grains) is adopted because it has been found experimentally to be exactly sufficient to precipitate one grain of uric acid. One cubic centimetre (16 minims) of the reagent, therefore, is sufficient to precipitate 1 milligramme (0.015 grain) of uric acid. The method is as follows: The phosphates are precipitated from the urine by the addition of an excess of carbonate of sodium, and separated upon a filter. Of the filtrate 20 cubic centimetres (5.41 fluidrachms) are employed, and are placed in a beaker. Into this fluid the above reagent is carefully titred, producing a milky turbidity, which rapidly settles as a white, flocculent, opalescent precipitate. As the point of saturation is approached, this turbid liquid is carefully filtered and the reagent added cautiously to the filtrate. When the filtrate, the solution having been refiltered, no longer shows turbidity upon addition of the reagent, the end of the reaction is indicated, and the result in milligrammes may be read from the graduation of the burette. This method is quite delicate, a solution of 2 milligrammes (0.031 grain) of uric acid in 100 cubic centimetres (3.38 fluidounces) of water giving a distinct reaction.

Creatinin.—Baldi[876 Mar.] carefully examined the urine of Succi during his fast of thirty days for creatinin. The quantitative estimation was made after Neubauer's method, the qualitative by the employment of nitroprusside of sodium. The result showed that creatinin was always present, until the seventeenth day, in notable amount; from that time until the end, in traces. The relation between the creatinin and nitrogen compounds remained unaltered. Baldi regards these results as an evidence that the presence of creatin and creatinin has nothing to do with the formation of urea.

PHOSPHATURIA.

An extensive article dealing with this symptom has been published by Peyer,[404 No. 386] reviewing it in its clinical details. In its origin it is apparently closely connected with some function of the nervous system, frequently manifesting itself in relation to some sexual affection. Phosphatic urine may present either an acid, alkaline, neutral, or amphoteric reaction; is often voided as a whitish, milky fluid which, upon standing, throws down a heavy sediment composed largely of the earthy phosphates. The patient usually is of the neurasthenic type, complaining of *malaise* and the usual train of symptoms of this condition, and calls particular attention to the subjective urinary symptoms of burning and vesical pain, and the physical characteristics of the urine voided. The urine of a phosphaturic may present its phosphatic characteristics only in the first morning micturition, or only in the evening, or at any time without reference to the hour. The turbidity may show itself in the first part voided, or in the entire quantity, or, as is very frequently the case, only in the terminal portion. The frequency of the condition is quite variable. It may be periodical, every day once or twice, or every two days; or it may be manifest only once or twice in a week. This condition is quite apt to be associated with sexual anomalies, pollutions, loss of virility, spermatorrhœa, or marked sexual irritability; and the sexual age (between 20 and 30 years) is that most frequently connected with the affection. It must not be forgotten, however, that under an alkaline diet or medication phosphaturia may be a physiological occurrence. The diagnosis is readily made if the urine be carefully examined, and the condition easily overcome by measures to lower the exaggerated alkalinity of the blood. Mossé and Banal[92, July] state that the modification in the constitution of the urine, as seen in cases of paralysis agitans, consists in a slight increase in the amount of urea and of phosphoric acid, coinciding with a diminution in the amount of phosphorus incompletely oxidized. Sendtner[34, No. 40, '88] publishes the results of a study of phosphaturia following chronic gonorrhœa, in which he recognizes as the cause of the symptom a micro-organismal change in the bladder, usually accompanied by actual vesical catarrh, but having at bottom another factor,—the excessive elimination of lime-salts.

Estimation of Earthy Phosphates.—Marshall[112, Mar.] has recently investigated the volumetric estimation of the earthy phosphates in urine by means of a solution of uranium acetate, after precipitating by ammonia. The especial object of the investigation bears upon the length of time required for complete precipitation by the latter reagent. His conclusions are: 10 cubic centimetres (2.71 fluidrachms) of ammonia (of ordinary laboratory strength) are sufficient to fully precipitate the earthy phosphates in 200 cubic centimetres (6.76 fluidounces) of urine. The addition of more than this has no other effect than to prolong filtration, because of the additional volume of liquid to be passed through the filter. Less time is required for filtration immediately after the subsidence of the ammonia precipitation than after standing for several hours, or than before the precipitate has fallen. A slight loss of phosphoric acid occurs if the urine be permitted to stand several hours after subsidence, but it matters little for clinical purposes whether the precipitate is washed or not before estimation.

Iodized Lime-water Test.—In the absence of free acid, iodized lime-water is recommended by Woods[2, May 18] for the recognition and for quantitative estimations of phosphates in urine. The phosphates are quite readily precipitated by this reagent if the urine be heated and the solution added, drop by drop, until precipitation is complete, when the result may be obtained by filtration and weighed after drying.

Chlorides in the Urine.—Lehmann,[20, Mar.] military physician in the Indian Netherlands, has examined the urine of a number of Europeans living in those tropical regions in relation to the amount of chlorine (as NaCl) contained in it. As an average, although the usual diet of these persons is somewhat higher in the amount of sodium chloride than that of the European laborer, the chlorine amount was found to be practically the same, 15.6 grains (1 gramme) in twenty-four hours. The proportion between the nitrogen and chlorine is, however, different, the former, as determined by Glogner, being about 7.18 grains (48 centigrammes) for dwellers in the tropics, 15 grains (97 centigrammes) for Europeans.

INCIDENTAL SUBSTANCES.

Boracic Acid.—Marsh[64, May], reports a case in which he found crystals of boracic acid in the urine after administration of 20 grains (1.30 grammes) of this substance four times a day for three days. Large crystals of various shape were to be recognized; these, taken up by alcohol and subjected to flame, gave the green flame of boron. The urine did not decompose readily, remaining quite uncontaminated after having stood in an open bottle for three weeks.

Salicylic Acid.—The influence of renal disease in the elimination of salicylic acid has been the subject of an investigation by Mdlle. Chopin.[67, Feb.13] The results may be summarized as follows: Salicylic acid augments the urine when the kidneys are healthy or the seat of chronic disease. The quantity is diminished in cases of acute nephritis. The amount of urea, uric acid, and phosphoric acid is augmented. About 80 per cent. of the salicylic acid is eliminated by the renal function. When the kidneys are diseased the elimination of the acid is affected, the first appearance being retarded and the duration of the elimination increased. The total amount of the acid eliminated by the kidneys is from 10 to 30 per cent. less than in case of healthy kidneys. The acid is largely eliminated unchanged, the remainder appearing as salicin and salicyluric acid. Albumen in the urine is increased by the administration of salicylic acid.

Lactic Acid.—Heuss,[273, B.26,H.1,2] following up the experiments of

Colasanti and Moscatelli, who determined the presence of lactic acid (as sarcolactic acid) in the urine of healthy persons after severe muscular exercise, has made careful estimations in 3 cases of normal urine excreted during periods of rest. In none of these 3 cases was he able to establish its presence, and he concludes that only after muscular exercise, and hence increased tissue-waste, is lactic acid found as a constituent of the urine.

Iodide of Potassium.—Ehlers,[373 No.1] mentioned by Levison, corresponding editor, has estimated the iodide of potassium eliminated in the urine during periods of large dosage by distilling the urine with chloride of iron and hydrochloric acid. The potassium salt is by this procedure broken up and the iodine separated by the distillation. Its quantity may then be reckoned by titration with hyposulphite of sodium. From observations by this investigator it would appear that from 50 to 90 per cent. of the salt is eliminated by the urinary system.

Mercury. — Cazeneuve[211 Apr.14] has proposed the following as a method readily employed for the estimation of mercury in the urine: A glass flask with rounded bottom is used, and to the lower portion a tube attached, provided with a cock. In this tube is placed an electrolytic element composed of a plate of platinum surrounded by an iron wire. The urine placed into the flask and distinctly acidulated (1 cubic centimetre — 16 minims — to the litre—1 quart—of urine) with sulphuric acid, the cock permits it to escape drop by drop, thus bringing the urine over the pile. The mercury is deposited upon the platinum plate, previously weighed. This last is then washed, first in water, then in alcohol, and weighed again. The increase in weight denotes the quantity of mercury contained in the urine. As an easy method for the estimation of mercury in the urine, Brugnatelli[589 June 12,18] recommends the following: Add a few drops of hydrochloric acid to 50 or 110 cubic centimetres (1.69 or 3.38 fluidounces) of the urine and place in it some copper strips or powder. Heat for five minutes at 50° or 60° C. (122° or 140° F.) to aid the deposition of the mercury on the copper. These are placed in a watch-glass, after having been washed carefully in distilled water, and beside the copper is placed a bit of porcelain, upon which is deposited a drop of a 1-per-cent. solution of chloride of gold. The crystal is covered by another watch-glass and heated upon a water-bath. The mercury is vaporized, and acting on the chloride of gold reduces it, causing the formation of streaks or circles of blue, violet, or rose gold; or, if the mercury be in sufficient quantity, the gold appears as the ordinary bright metal. It is important to have the copper in this method in perfect purity, and the porcelain heated to insure the absence of organic matter.

Lead.—Putnam, of Boston,$^{61}_{\text{Oct.6}}$ in a paper upon the frequency with which lead may be found in the urine, stated that the conclusions which his investigations seemed to provisionally justify were these: that it is not likely, in the urines of persons not presenting distinct symptoms, to find lead in more than 50 per cent., and that its discovery in any special group of cases in a greater proportion would be presumptive evidence that lead was connected with the production of the symptoms. Of 68 persons, either quite healthy or presenting symptoms only of specific or local inflammatory disease, 17 per cent. showed the presence of lead in the urine. Of another group of 129 persons who presented various symptoms of disease, such as might be thought, at least, partly due to lead-poisoning, 50 per cent. showed this substance in the urine.

Iron.—Gottlieb$^{278}_{\text{B.M.H.1,2}}$ practices the following method for the estimation of iron in the urine. The entire urine of twenty-four hours is evaporated, and the residue fused in an earthen crucible. The white ash is treated with water, and that which remains undissolved is dissolved in a little muriatic acid. Every precaution is to be taken to perform the estimations in conditions in which contamination with iron is impossible; the reagents should be carefully examined to prevent any such contamination, and the room should be free from dust which may contain a proportion of iron. To this acid solution of the iron and phosphates a few drops of a 1-per-cent. solution of chloride of zinc are added, and then, avoiding a too great excess, a precipitate thrown down with ferrocyanide of potassium. The slight excess of ferrocyanide is to be gotten rid of by adding more chloride of zinc, and if in the clear fluid a drop of the zinc solution shows no more precipitate it is thus recognized to be present in excess, and the solution, after standing some time, is filtered. In order to get rid of the phosphates, after having washed with acidulated water, the precipitate upon the filter is treated with warm 2-per-cent. solution of potash. After washing the precipitate with hot and then cold water, it is dissolved in weak muriatic acid, from which the iron can be precipitated by the addition of ammonia. This first precipitate of iron (as the hydrated oxide) is apt to have small quantities of zinc present, but after a number of solutions and precipitations the result is quite pure.

In normal urine Gottlieb determined the iron by the above method to be present to the amount of about 2.5 milligrammes (0.026 grain) in the total urine. In patients taking iron, the iron excretion would seem, at first, to be decreased, and this decrease tends gradually to become normal, but for many days the amount scarcely reaches the usual excretion.

TOXICITY OF THE URINE.

Bouchard[8 Sept. 13] divides the poisons of the urine into two classes, organic and inorganic, the prominent members of the latter class being the salts of potassium. The organic poisons arise from faults of cellular function or from the activity of micro-organisms, usually in the intestinal tract. Realizing the condition of microbic infection of the alimentary tract, the toxicity of the urine may be relatively approximated. Without entering into the question of the nature of these poisons, except to point out that the toxic substances in the urine from an infectious disease possess toxic powers of a nature similar to the disease infection, the writer indicates that the more marked the intestinal infection, the greater becomes the toxic power of the urine. In a normal state of health the lower bowel is always, to a certain degree, the seat of bacteritic processes, and the urine, as a consequence, even in health, possesses well-marked toxic power. Godet[1161; 266 Oct.] clearly reviews the knowledge existing upon the subject of urinary toxicity. He states that the existence of urinary alkaloids depends upon the formation of leukomaines by the cellular economy and of ptomaines formed from micro-organismal activity. Lépine[211 May 6; 922 June; 2 June 1] succeeded in inducing an auto-intoxication in animals by producing a counter-pressure to the secretion by ligating the ureters. Noting, as one of the first symptoms produced in healthy animals, a progressive and considerable rise in temperature, he infers that there has thus either been retained or re-absorbed from the urine a substance having a thermogenic nature. Stadthagen,[114 B.15,H.5,6] reviewing the investigations of a number of observers upon the toxic substances in the urine, confirms Lépine as to the toxic value of the potassium salts, and does not think it necessary to assume the existence of ferments or ptomaines (Bouchard) to explain the phenomena of uræmia. In his view these are sufficiently accounted for by the potassium salts and the retention in the system of urea, uric acid, creatinin, and other nitrogenous bodies. The author points out that urotoxin, a substance announced by Schifer and Bouchard, and regarded by the former of these observers as allied to peptotoxin, differs markedly from the latter in point of solubility. Lépine has been unable to demonstrate the presence of guanidine in human urine by the method prescribed by Girgens and Baumann (agitating the urine in a warm atmosphere with freshly-precipitated oxide of mercury), nor does he regard methylguanidine as likely present. Gautier some time since announced, among others, an extremely poisonous ptomaine in meats, standing near creatinin in composition ($C_5H_{10}N_4O$), which he named xanthocreatinin. The author, following the same methods with normal urine after prolonged muscular exercise, isolated a substance probably allied to the above, but differing materially in the percentage quantities of the constituents. This substance, when pure, crystallizes in prisms, and is probably some form of creatinin.

Roger and Gaume originally proposed the estimation of the potash salts in the urine as the bitartrate of potash, after the following procedure: 100 cubic centimetres (3.38 fluidounces) are evaporated to one-fifth volume, filtered after becoming cool; to this filtered liquid 10 cubic centimetres (2.71 fluidrachms) of a saturated solution of tartaric acid are added, and the mass brought to the boiling-point. After twenty-four hours in a cool place, the resulting bitartrate is washed to get rid of coloring substances, thrown on a dry filter, dried, and weighed. Quite recently Robin[8, May 22] has severely criticised this method of estimating these toxic matters, pointing out that the results are greatly excessive, owing to the fact that hippuric acid, and, to a certain extent, uric acid, are thrown down with the bitartrate of potash, the former of which, being quite insoluble, is not eliminated by washing at all, and constitutes a grave factor in error.

Thudichum[22, Nov. 24, '88] publishes a brief review of his work upon the urinary alkaloids and their methods of isolation, confirming his previous reports. He regards uræmia, in its severe and fatal nervous phenomena, as caused by these alkaloids, or by the products of their decomposition.

Micro-organisms in the Urine.—The especial receptivity of the urinary tract toward microbes, in the condition of urinary retention, is developed by Guyon,[152, May 2] in a communication to the French Academy of Sciences. The introduction of septic sources, unclean catheters, or other instruments, is a constant source of danger in these cases; and the condition of relaxation present after the withdrawal of the excessively retained fluid presents a peculiarly favorable soil for the growth of bacteria, not only because of the simple relaxation and probable lack of resistance, but because in these cases the mucous surface of the tract is liable to be the seat of innumerable ruptures of continuity. If by chance the microbes have gained entrance into the distended tract before the withdrawal of the urine, the absence of the flushing of the ureters because of the general distention offers a special facility for the generalization of the infection. Under the term "bacteriuria," Peyer,[214, July 15] considers the clinical features of mycotic vesical infection, illustrating his paper by the account of 3 cases, a young girl and two adult females, in whom this condition prevailed. The urine in these cases is always clouded, somewhat opalescent, and throws down a slight white precipitate. Where there are no other bladder affections complicating the case the reaction is usually acid, and shows little tendency, as in other vesical maladies, to undergo an ammoniacal fermentation, often persistently maintaining a strong acid reaction for a very long time (Ultzmann). The cellular elements in the sediment are apt to be scant, a circumstance pointing with much suggestiveness to the absence of cystic catarrh. If the affection be very marked the urine is apt, if not filtered, to respond faintly to the various albumen reactions, but after filtration through a Pasteur or Chamberland filter these tests fail. In the writer's view this albumen reaction is not evasive, but really indicates the presence of albuminous matter in some way connected with the life processes of the micro-organisms. The odor of the urine is of a peculiarly strong, penetrating urinous character. The specific gravity is rarely other than normal. Upon agitation the urine shows a peculiar undulatory movement (Wellenbewegung) similar to that noticed in fluids containing cholesterin, which Peyer regards as characteristic. In none of these cases does the author seem to have made any culture observations upon the micro-organisms present in the urine, but made the diagnosis from the microscopic recognition of the presence of enormous numbers of bacteria in the urine immediately after micturition. The symptomatology of the affection is not, as might be supposed, entirely local,—vesical irritation and burning upon micturition,—but presents certain well-marked general features—malaise, nervous manifestations, and functional disturbances of the genital apparatus. The prognosis should be guarded, extreme difficulty in entirely overcoming the condition being experienced, besides there being an element of danger from the subsequent infection of the kidneys. As to the treatment of the affection, which is apparently much more frequent in women than in men, it simply resolves itself into special measures of cleanliness, associated with endeavors to render the bladder-cavity aseptic both by antiseptic injections and the administration internally of such agents as salicylic and boracic acids. The author mentions Schottelius and Reinhold, of Freiburg, as having made investigation into the nature of the bacteria in these cases of bacteriuria. According to these experimenters, a bacillus plays an important rôle in the affection, appearing in enormous numbers in the urine. Plate cultures showed grayish-white, more or less granular-looking colonies. The individuals, sometimes quite long, usually measured about five times their breadth in length. Experiments upon animals by systemic injection and injection into the bladder indicated their non-pathogenic character, so far as such animals are concerned. Doyen[14, Apr.3] has studied from a bacteriological point the urine in cases of cystitis, pyelonephritis, and urinary infection. He found fourteen varieties of micro-organisms,—ten bacilli and four micrococci. The bacilli, briefly, present the following features: *bacillus urinæ claviformis*, showing a stud-like growth upon gelatin, a flabby, exuberant growth on agar, and a smooth, prominent growth on gelatin-peptone plates; *b. urinæ fertilis*, very similar to the above upon agar, on gelatin plates showing a shriveled, granular culture; *b. urinæ major*, showing, as do the following, a growth from a central focus, as described by Clado, the growth on agar characterized by its transparence and the presence of seven or eight prominent longitudinal striations over the culture; *b. aerobius*, not growing along the inoculating cut; *b. striatus*, showing upon agar a more or less shriveled growth with transverse ridges; *b. urinæ mollis*, growing upon agar in a smooth, moist, flourishing culture; *b. urinæ tenuis*, a smaller, thinner growth than the above, having a yellowish appearance upon agar; *b. pellucidus*, showing a thin and extremely transparent growth; *b. urinæ diffluens*, extending rapidly over the entire surface of the agar; *b. urinæ liquefaciens*, differing from the preceding only in liquefying gelatin. None of these bacilli take the Gram or Weigert stains well. The four forms of micrococci isolated are named by the experimenter *micrococcus urinæ albus*, *m. urinæ major*, *m. urinæ albus olearius*, and *m. urinæ flavus olearius*.

Russo-Giliberti and Dotto$^{772}_{p.97,}$ $^{6}_{Ap.30}$ have recently studied the power of micro-organisms to produce ammoniacal fermentation in urine. Making up a solution of pure urea (2 per cent.), they placed 100 cubic centimetres (3.38 fluidounces) of it in sterilized tubes, and sterilized the solution after Tyndall's method, keeping the tubes for an hour each day for seven days in a temperature of 65° to 70° C. (149° to 158° F.). Testing for the absence of nitrogen, as ammonia, or nitric or nitrous acid, and of carbonic acid, and having proved the absence of micro-organisms by keeping tubes for ten days at a temperature varying from 25° to 30° C. (77° to 86° F.), penicilium was planted in one tube, in which there presently was found an abundance of ammonium carbonate from transformation of the urea. The urea-decomposing microbes thus far announced comprise the following: *micrococcus ureæ* of Pasteur and Van Tiegheim; *bacillus ureæ* and a form of aspergillus described by Miquel; a sarcina and three forms of bacilli mentioned by Leube; *micrococcus ureæ liquefaciens* reported from Flügge's Institute; four bacilli (three liquefying gelatin) discovered by Heraeus; and *bacillus fluorescens* reported by Warrington. To this list is to be added the above discovery of these two Italian investigators.

Clado,$^{7}_{No.24}$ before the Société Anatomique de Paris, objected to the acceptation of the micro-organism described last year by Hallé and Albarran as a pyogenic bacterium of the urinary tract, and insisted that it is identical with the form originally announced by him as a septic bacterium of the bladder. The objection was not favorably received on the part of Hallé, however, who avers a difference sufficiently marked to separate the two forms.

Pneumaturia.—The presence of gas in the urine is a rather rare symptom. Müller, of Bonn,$^{4}_{Oct.14}$ has recently had brought before his notice such a case, and has taken the opportunity of publishing the records, together with the results of certain researches bearing upon the subject. The patient, a man aged 60 years, who had never previously suffered from any urinary complaint, and had never had any symptoms of diabetes mellitus, noticed, in 1873 or 1874, that his urine was peculiarly turbid and had a bad odor. As the case progressed and frequent micturition became a feature of the case, the patient went to Carlsbad, where an electrical treatment was employed. The passage of a thick electrode increased the difficulty, and presently incontinence of urine became marked. Some months later (in 1884) the patient noticed for the first time that when he urinated, at the close of micturition especially, there was a peculiar interruption of the stream, with a bubbling, indicating the passage of gas with the liquid; this occurred at irregular intervals, every week, or later, every day or two. When he came under Müller's notice, in 1888, he complained of frequent micturition and difficulty in retaining the urine. Any nervous start was sufficient to cause an involuntary passage of urine. There was found to be always present in the bladder a considerable amount of residual urine. The fluid was turbid, of a peculiar, not especially unpleasant odor, yellow color, and acid reaction. Examination under the microscope showed the presence of bladder epithelium, leucocytes, and numerous micro-organisms. It contained a small quantity of albumen; if allowed to stand a time after withdrawal from the bladder it contained no sugar, but if tested at once was found to show from 0.6 to 2.5 per cent. of sugar by the various methods for estimation. The quantity of gas contained in the bladder varied considerably, at one measurement 20 cubic centimetres; again, 52 cubic centimetres; again, 12 cubic centimetres; and a fourth time 13 cubic centimetres. Examination of the gas was upon two occasions made, with the following results:—

VOLUME.	I. Gas After Standing in a Endiometer for Five Days (18.817 Cubic Centimetres—29 Pints).	II. Freshly-Passed Gas (12.096 Cubic Centimetres—25 Pints).
CO_2.	19.80 per cent.	9.16 per cent.
O.	0.23 " "	0.00 " "
H.	44.25 " "	57.31 " "
CH_4.	0.086 " "	0.79 " "
N.	35.63 " "	33.52 " "

After the withdrawal of the gas from the bladder it was impossible to entirely exclude the air, and it is possible that the quantity of nitrogen should be lowered on this account. A point indicating the likelihood of this contamination by the air is the fact that in the case of the freshly-passed gas there was absolutely no free oxygen, while in that which had been standing for some days there is a distinct amount present. Further, it is likely that, even when in the bladder, the gas was more or less changed in its constitution from the diffusion of the gases of the blood and tissues. This last circumstance must be called upon to explain the occurrence of the CH_4. This gas is formed in the intestines, and, as shown by Tacke, is largely re-absorbed and thrown off by the lungs; it is quite probable, then, that a gas in one of the body-cavities, as the bladder, with an opportunity for diffusion with the gases of the blood, should contain at least a trace of the carburetted hydrogen. As to the origin of the gas, its nature precludes its origin elsewhere than in the bladder, and the absence of other symptoms (as of the presence of matter from the bowel) confirms such an opinion. The presence of sugar in the urine when freshly withdrawn, and its disappearance after standing, together with the nature of the gas, points strongly to the probability that a fermentive process acting upon the sugar contained is at the bottom of the symptom. Endeavors to cultivate micro-organisms which might be the causative factor of the process were not successful, but a significant fact is that if ammoniacal fermentation occurred in the urine before the sugar change was complete it at once checked the latter. The process was in no way associated with the usual form of pneumaturia—the production of H_2S in the bladder—hydrothionuria.

TECHNIQUE, ETC.

Cockey, of Baltimore,[104, Feb.16] recommends, for the preservation of the formed elements in urines, a glycerole of salicylic acid and borax (2 to 1), adding four or five volumes of water for use. Another solution mentioned by this gentleman is composed of salicylic acid added in saturation to a weak solution—acetate of potassium (a saturated solution of the potash salt to which 16 volumes of water have been added).

Wendriner[297, No.8; 6, Apr.6] recommends as a point in the microscopic examination of urinary sediment, in order to prevent the annoying deposit of urates and fermentative or decomposition products tending to hide casts and other formed elements, that to a volume of urine should be added from one-fifth to one-third of an equal volume of a nearly-saturated solution of borax and boracic acid. The solution is prepared by mixing 12 parts of powdered borax with 100 parts of hot water, then adding a similar quantity of boracic acid, stirring constantly. The solution should be filtered hot. After long standing there may be a slight deposit, but as this clings to the sides of the bottle and does not interfere with the transparency of the liquid, it can scarcely constitute an objection.

Microscopy.—O'Neill [6, Sept. 14] reports the case of a male, aged 50 years, who for several years had passed by the urethra hairs of varying shades and from 2 to 4 or even 5 inches in length. At first they were single, but afterward became more numerous, and sometimes were passed in little tufts. Occasionally hæmaturia occurred. Death occurred from an intercurrent cause, but unfortunately no post-mortem examination was permitted. The hairs, in the writer's opinion, probably originated from some papillomatous growth.

Handford [2, May 4] describes, under the term "miliary pyuria," a condition of the urine in which, plainly visible to the eye, are minute aggregations of pus-cells from $\frac{1}{500}$ to $\frac{1}{100}$ inch (0.00005 to 0.00025 metre) in diameter, or larger. Under the microscope he cannot be sure that they are tubercles, although in the two cases in which he has met these bodies there was reason to suspect renal tuberculosis. Sometimes the masses were covered over with red blood-globules. Their structure did not show any giant-cells, or, in fact, any well-marked cellular system. They seemed to be made up of inspissated pus, which had been rolled into these masses, either by the fluid passing along the ureter or in the bladder by the motion of the urine in that viscus. Walker [2, July 20] has met a similar case which was diagnosed as a case of tubercular pyelonephritis.

Kinnicutt [50, Mar. 9] reports a case in which, with biliary retention, there occurred bile-stained urine, containing numerous hyaline and granular casts and albumen. On the fourth or fifth day of the attack, a large quantity of cholesterin crystals were discovered in the urine several hours after it was voided. This condition persisted through the attack, lasting several days after the disappearance of the jaundice, the albumen, and the casts. This appearance was, in all likelihood, due to the formation of cholesterin from fatty substances in the economy not properly altered by the hepatic functions.

Casts in the Urine.—The question of cast formation, especially in regard to the hyaline casts, which are the basis of other varieties so frequently, has continued a mooted point. It is supposed by certain authorities that their formation is due to a hyaline degeneration of the epithelial cells, with subsequent fusion into a solid mass. Others regard these hyaline cylinders as produced by the agglutination of material, which by some is supposed to represent vacuoles in the lining cells, but which, by these writers, is looked upon as being the result of a coagulation of the cellular albumen. This being in some way thrown out of the cellular economy and agglutinated, by these authorities forms the basis-substance of these hyaline casts. There are numerous and reasonable objections to both these views, and recent observations go to substantiate the idea that the true origin, in most cases at least, is from the intra-canalicular coagulation of albuminous material transuded from the blood. A valuable article upon the subject was contributed by Török and Pollak, noted in last edition of the ANNUAL, and a recent observation by Verhoogen[276, Oct. 30] substantiates the same view. This writer has observed, after producing alterations of the renal circulation by cutting the nerves entering the hilus of the kidney in animals, the formation of masses of material within the tubules identical in staining properties and chemical reaction with the material of hyaline casts, the cells and membranes of the tubules remaining, to all appearance, an unchanged condition. The experience of the editor of this article may be taken as contributing to the same opinion. In several instances, in urines containing these casts, individuals were observed in which a central channel could be plainly discerned, strongly suggesting the idea of the coagulation of the albumens of a liquid passing over the epithelial surface of the tubules, the size precluding the idea of the fusion of the lining epithelium, and its concentric formation strongly pointing to the growth of these casts toward a centre as yet not formed. Von Hoesslin[34, Nov. 3] describes a peculiar form of cast found in a urine free from albumen, passed after a slight colicky attack. To the naked eye this urine deposited in the precipitation glass a delicate sediment, in which one could easily see very delicate, feathery appearances. Upon heating to the boiling-point these disappeared, as, too, upon the addition of a solution of potash. Upon examining under the microscope, these bodies were found to be made up of a hyaline material, and to all evidence were renal casts. This peculiarity, however, characterized them: they were dichotomoid, branched, a number of small ones uniting to form a large one. This branching has been described by Bartels, but only to a very slight degree and of very rare occurrence. It is extremely difficult to know from just what part of the kidneys these casts could originate, but it is possible that they represented the union of the convoluted with the straight tubes. Another peculiarity in the formation of these cylinders depends upon the fact that the axis contained numerous uratic granules, leading to the supposition that their formation occurred from the outpouring of some coagulable material, from irritation of the epithelial surface by these uratic deposits. Nor is it likely, because of the relations between this granular deposit and the hyaline portion of the casts, that these cylinders could have been formed from mucin, after the passage of the urine into the lower urinary tract or into the vessels.

BACTERIOLOGY.

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METHODS.

Coloring bacteria has received several important contributions, among which may be mentioned the use of acid fluids.[7 No.31] The advantage is that bacteria will not develop in them and obscure the results, and the author claims to be better able thus to stain the bacillus of typhoid than by any other means. The section is treated with a strong, watery solution of methyl violet (6 B), made distinctly acid with acetic acid, then washed well in water, and finally passed through a strong solution of iodine and iodide of potash,—after Gram's method.

A new method of illustrating plate cultivations of air organisms[213 June] is by pasting sheets of ordinary black wall-paper upon thick, white cartridge-paper, and then, with gum, sticking small pieces of white or colored paper upon the black surface to represent the various colonies.

A manipulating chamber is suggested by Dixon[80 Mar.] for the purpose of handling cultures with as little danger of contamination as possible. It consists essentially of a bell-glass, with three openings, on a closely-fitting stand, one opening at the top for the entrance of air and to be stoppered with cotton-wool; the other two are at opposite sides for the hands of the operator, and may be closed around them by rubber sleeves strapped around the wrists. Such an apparatus is often very useful in a crowded laboratory.

The methods for the formation of museums for illustrating bacteriology are treated by Kral,[58 Jan.] and a very good method for preserving cultures is described by him. It consists mainly in growing the organisms in test-tubes with feet, and then sealing the tops with heat after the colony is well developed. Czaplewski[50 Sept.28] gives further suggestions in the same direction, especially that the ordinary nutrient gelatin should be used only for the non-liquefying organisms, and some other medium for those that liquefy this material,—for example, and best for the purpose, Soyka's "milk-rice." (See this article for last year.)

Schill[50, Mar. 1] suggests, for the preservation of plate or other cultures, that they can be preserved with a mixture of equal parts of alcohol and glycerin, to which has been added 0.1 to 1.0 per cent. of sublimate solution. The solution must be added with care to tubes by pouring down the side, and, in the case of plates or potatoes, by dropping from a little height; it must be allowed to act for a few days. Then the gelatin or agar-agar can be removed with a spatula, and the specimen can be stored in that condition. For Esmarch's roll cultures he uses small, round medicine-bottles, which can be as well sterilized as the ordinary tubes, and at the same time avoid the wetting of the cotton plug. He avoids the inequalities in the ordinary roll cultures by using two tubes, one of them smaller than the other, and placed inside of it with the gelatin between them; after the gelatin has hardened the inner tube can be removed by filling it with warm water, or it can be left *in situ*, if it be desired to cultivate anaërobic bacteria. He uses flat glass bottles for plate cultures rather than ordinary plates, and recommends the use of wafers for the cultivation, especially of the color-forming bacteria, because the white ground gives an exceedingly good background for the colors; the wafer is well soaked with the nutrient material and may be put in a "Petri" box. The growth of molds may be hindered, without stopping the growth of bacteria, by adding a morsel of camphor to the nutrient material before sterilizing.

Günther[69, May 16] also has some new methods for the preservation of bacterial growths. The first is for the preservation of colonies grown upon agar-agar. The colony is cut out of the nutrient material and lifted with a spatula upon a slide, which has been moistened with a drop of glycerin; a cover-glass, also with a drop of glycerin, is then inverted upon it. The amount of the glycerin must be enough to force all of the air out, and this may be completed with filter-paper. The cover is fastened with dammar varnish and the preparation may be kept for an indefinite length of time. The same writer suggests that the annoyance coming from the "condensation-water," in the use of potato for cultures in test-tubes, may be avoided by placing a small piece of glass rod at the bottom of the tube; this will lift the whole above the moisture that collects so freely in this kind of work, and at the same time preserve all the advantages of the method.

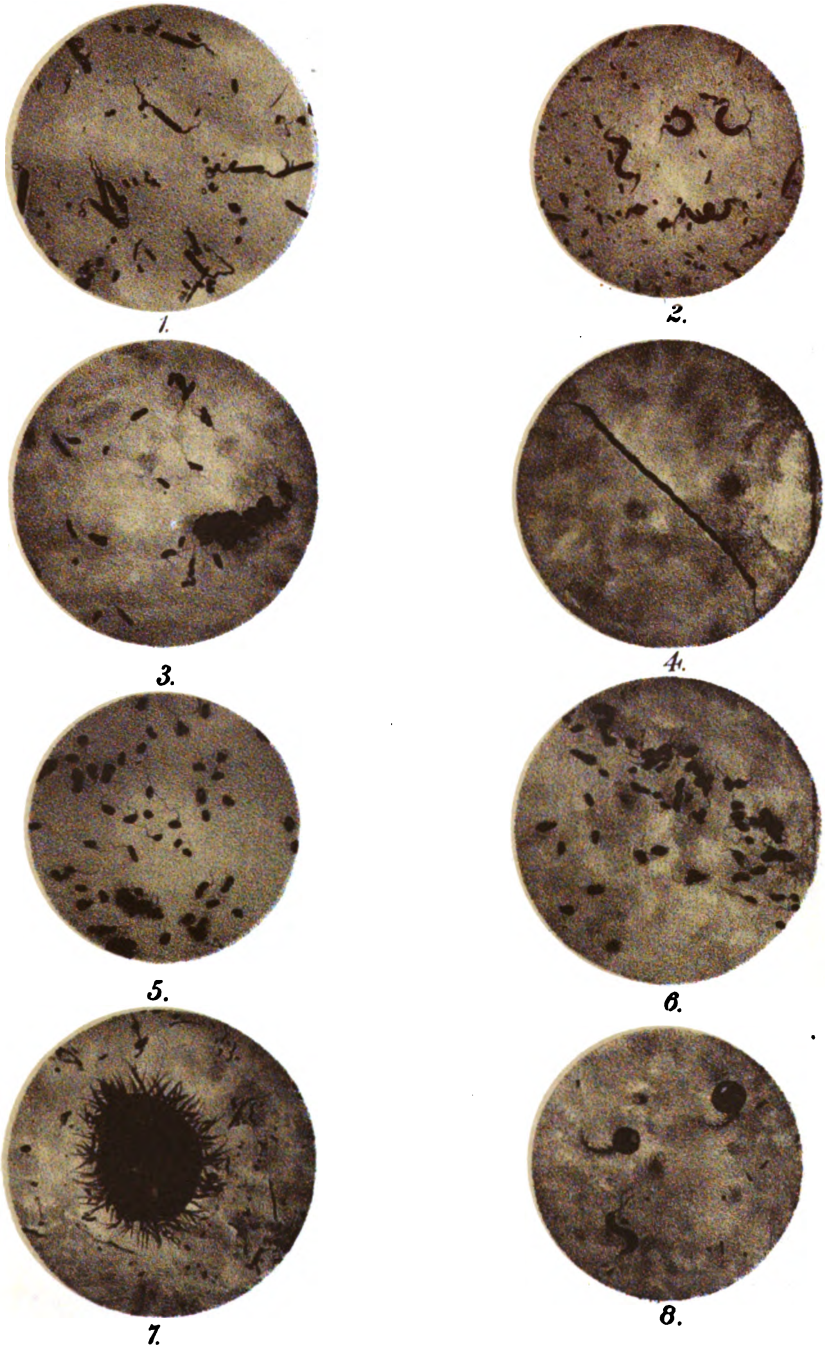
Photo-micrography is shown to have taken a great stride by the work of Fränkel and Pfeiffer, which has been appearing in parts during the last year. It represents the best work that has yet been done in this direction. A few specimens of this work are reproduced in the illustrations of other portions of this article, and speak for themselves.

New syringes have been suggested by Strauss,$^{2}_{\text{Feb.16}}$ and Tavel.$^{50}_{\text{Apr.12}}$ That of the former consists of the ordinary Pravaz syringe, with the working piston in a cylinder of elder-pith, so arranged that it may be enlarged transversely, and thus made to compress the sides of the cylinder more firmly. The ends of the glass cylinder are secured to the metallic mounts by disks of the same material, instead of the ordinary ones of leather, and are therefore free from the leakage that is sometimes so annoying. That of Tavel is a syringe reduced to its simplest parts, and consists of a glass tube drawn to a point and connected with the ordinary syringe by a rubber tube with a pinch-cock between. The proximal end of the tube may be stoppered with cotton-wool, and then the inoculating material may be drawn up into the tube and forced out of it under the skin with as little risk of contamination as may well be.

Milk as a culture medium is, of course, one of the most important that we have, but has not been of much use thus far because it is not transparent. Van Puteren,$^{50}_{\text{Jan.26}}$ has apparently solved this difficulty, however, and in the following manner: To 1 litre (quart) of skim-milk, in a tin saucepan of 1.5 litres' ($1\frac{1}{2}$ quarts) capacity, is added 5 to 6 cubic centimetres ($1\frac{1}{3}$ to $1\frac{2}{3}$ drachms) of rennet-essence, and then warmed over a Bunsen burner at 40° to 42° C. (104° to 107.6° F.). When the temperature has reached 36° C. (96.89° F.) coagulation begins, the fluid becoming yellow and transparent. After three to five minutes, the coagulum having shrunk, the liquid is passed through eight folds of (Marly) filter-paper. The filtrate is now reduced to 860 or 880 cubic centimetres (28 fluidounces) and returned to the pan, the whites of 2 eggs and gelatin in the proportion of 6 to 10 per cent. being added. After the gelatin has been completely dissolved by stirring, the mixture is heated to boiling, when the egg-albumen, previously slimy, coagulates, carrying with it to the bottom a thick precipitate; this occurs after four to five minutes. The contents of the vessel are again filtered as before, and about 2 per cent. of sodic albuminate is added; then a weak solution of caustic potash to neutralization. The fluid is once again filtered through cotton in a glass funnel, the cotton having been moistened with water, and the loss from evaporation is made up by adding water, about 100 cubic centimetres (3½ ounces). The filtrate sets firmly on cooling, and is clear and suitable for most purposes; but if an absolutely clear medium is required, it is simply necessary to repeat the filtration through a vacuum-filter, and finally through paper in a Plantamour filter. (Points: Much time will be gained by constant stirring during coagulation of the casein, and while the gelatin is being boiled its burning may be prevented by the same precaution. The egg-albumen must not be added before it has thoroughly cooled, because, if it is, it will coagulate before it has become thoroughly diffused. The boiling must be stopped before, or as soon as, the milk becomes thoroughly coagulated, but filtration must not be attempted while any of it is in a glairy condition, so as to stop the pores of the paper while trying to pass through.)

Another solid culture medium may be prepared from milk, sodic albuminate, and agar-agar in the same manner, except that the agar-agar is added in the proportion of 1 per cent. at the same time as the white of egg, and the mixture boiled for seven to ten minutes, by which time the agar-agar is completely dissolved; but the complete coagulation of the egg-albumen requires four or five minutes' more boiling. When the process is complete and the mixture has set, there will be seen a cloudy precipitate at the bottom of the mass, which must be cut off and thrown away. (Tin vessels are preferable to glass because they take less time to heat, —and a flame of fifty burners to one, because too high a temperature, or one too long maintained, even if under 100° C. (212° F.), will cause the milk-sugar in the presence of an alkali to assume a brownish hue).

Loeffler[50, Aug. 18] has published a very interesting and important paper upon staining the cilia and flagellæ of bacteria, illustrating his article with photo-micrographs which are so perfect that they are reproduced here.



1. 2. 3. 4. 5. 6. 7. 8.

Staining of cilia and flagellæ of Bacteria (Loeffler).

Centralblatt für Bakteriologie

Explanation of Plate.—All the photographs were taken with direct sunlight. Zettnow's chromate-of-copper filter, Zeis's Apochrom, 2 millimetres, Ap. 1, 40, open condenser, projection ocular, and Schippang-Wehenkel's orthochromatic plates. Fig. 1. Large motile bacillus, obtained from plant-infusion, with long, powerful flagellæ. Mordant was Leonhardt's gallic acid, stained with alkaline aniline-fuchsine. Fig. 2. Spirillum undula with flagellæ. Mordant was ferro-tannate-logwood solution. Stained with alkaline aniline-fuchsine. Fig. 3. Motile bacteria from a hay-infusion. Mordant and staining as in 2. Fig. 4. Spirillum rubrum (Esmarch), with flagellæ at both ends. Mordant and staining as in 1. Fig. 5. Cholera bacteria with flagellæ. Mordant and staining as in 2. Chromate of copper and picric-acid filter. Fig. 6. Cholera bacteria with flagellæ. Mordant and staining as in 2. Chromate of copper and picric-acid filter. Fig. 7. An infusorium with cilia. Mordant and stain as in 2. Fig. 8. Monad with feathered flagellæ. Mordant and staining as in 2.

His method consists essentially in the use of a good mordant in addition to the usual aniline solutions employed. It is as follows: 1. The mordant: Add 10 cubic centimetres ($2\frac{3}{4}$ drachms) of a 20-per-cent. aqueous solution of tannic acid, drop by drop, to an aqueous solution of ferrous sulphate until a black-violet color is obtained. In another vessel rub up one part of extract of logwood with eight parts of distilled water, and add, cautiously, sufficient of this liquid to the first solution, until the color of the latter is changed from a blue-black to a muddy-dark violet, ceasing the addition before a precipitate is thrown down. As a preservative, add 4 or 5 cubic centimetres ($1\frac{1}{3}$ drachms) of a 5-per-cent. aqueous solution of carbolic acid. 2. The stain: Into an Erlenmeyer flask, containing 5 grammes (77 grains) of any of the common aniline colors (fuchsine, methylene blue, or gentian violet), pour 100 cubic centimetres ($3\frac{1}{3}$ ounces) of aniline-water that has been freshly made, and to which has been added 1 cubic centimetre (16 minims) of a 1-per-cent. solution of sodic hydrate. Close with a rubber cork and shake until solution has taken place. This is the stock solution from which a few drops are to be filtered as they are needed. 3. Method of using: Prepare the cover-glasses in the usual way and flood them with the mordant, carefully steaming them over the flame for a few seconds. Wash with plenty of water, and thoroughly remove all excess of the mordant. Float the stain on the preparation and steam gently over the flame for a few moments,—being very careful not to burn it; when fuchsine is used, the process is complete when the cover-glass becomes a blackish-red color. Wash thoroughly, and the specimen may be examined at once, or may be mounted and preserved in the usual way.

Touraillon—a vegetable product resulting from the germination of malt, and already used by some observers as a culture medium—has again been suggested by Roux,$^{211}_{\text{Sept.22}}$ who has found it to do good service in the culture of most organisms, especially of the streptococci, which, as a rule, develop very slowly in nutrient gelatin. It is made in the proportion of 10 grammes to 100 cubic centimetres (154 grains to 3⅓ ounces) of water, and the mixture must, of course, be well neutralized before it is used.

NEW BACTERIA AND NEW FACTS IN REGARD TO OLD ONES.

Bacillus Enteridis (Gärtner).—This organism has been found by Karlinski$^{50}_{\text{Sept.8}}$ in a case of poisoning from eating dried flesh, and has shown the same characteristics under cultivation and upon inoculation, as already described by Gärtner.

Bacillus heminecrobiophilus, found by Arloing$^{211}_{\text{Mar.3}}$ in the contents of a cheesy gland, with properties a little different from the vibrion septique. It is both aërobic and anaërobic, and is a remarkable example of polymorphism, appearing as bacillus, from 3 μ to 4 μ long, in gelatin; from 1 μ to 4 μ long, and at the same time as micrococcus, in bouillon; and, with contact of air, as micrococcus and fine, short bacillus on potato; and, finally, as long bacillus, 8 μ to 20 μ long, in bouillon and in an atmosphere of carbonic acid. Inoculated in large or small quantities, in various ways and in different animals, it produced no effect; but when inoculated in the testicles of a ram deprived of circulation by the tourniquet, there resulted a very marked and dangerous disturbance. The organ rapidly enlarged, becoming œdematous and crepitant, and finally softened and broke down. Material from it injected into the conjunctiva of another sheep, however, produced no more effect than the inoculation of the pure culture had done.

A bacillus staining gelatin brown is described by Scheibenzuber.$^{5}_{\text{Oct.15}}$ It is very motile, and grows on plates as round, brown clumps, which later become broad and clear. It is non-liquefying. In needle cultures it spreads over the surface of the gelatin, and grows along the needle-track like the teeth of a saw. The gelatin is stained, through the whole of the needle-track, of a brown color, the coloring commencing at the middle or lower end of the track. On potato it forms a brown layer, and also stains agar-agar brown; later, the color becomes clear. Injection into white mice, negative.

Cholera.—Loewenthal[2 Feb.16] claims to have demonstrated the toxic action of salol on the spirillum of this disease, and thinks that his experiments should be confirmed by careful clinical work in the hospitals.

Kitasato[58 Apr.12] studies the action of the cholera spirillum in connection with other bacteria, and comes to these conclusions: that there is no form of bacteria which will grow in the ordinary nutrient media with the cholera spirillum,—which will quickly and certainly kill out the latter,—whilst, on the other hand, there are a number that are quickly killed out by it; even the anthrax bacillus is rapidly destroyed in the same culture medium with the cholera spirillum. Uffelmann[50 No.15] says, in relation to the vitality of the cholera spirillum, that in fæces it lived for four days at the most, and that a temperature of 61° F. (16.1° C.) seemed to favor it better than one of 48° F. (8.8° C.); whether the presence of urine in the fæces made any difference or not was not determined. (The author also makes some interesting statements in regard to the vitality of the typhoid bacillus in the same medium,—fæces,—*i.e.*, that its resistance is very great and that it retains its vitality for almost four months, the question of temperature affecting them, as would be only natural, that of the ordinary room being followed by a marked increase in the number.) Petri,[50 Apr.20] in an elaborate article on the reduction of the nitrates by the cholera spirillum, comes to the following conclusions: (1) the cholera spirilla reduce the nitrates into nitrites during their growth; (2) the ordinary culture media, and often the salt purchased in the market, contain not inconsiderable traces of nitrates; (3) the "cholera red" comes by reason of this impurity, and occurs by reason of the reduction of the nitrates into nitrites; (4) an oxidation of the split-up ammonia has not been observed, and, by reason of one experiment, seems to be improbable. Schenk,[61 Aug.24] by using a culture medium prepared from the albumen of the lapwing's eye, succeeded in showing a marked difference in the growth of the cholera spirillum and that of Finkler-Prior. The latter liquefies and discolors the middle of the medium, while the former does not.[14 No.46] Pfeiffer and Nocht[58 Nov.7] have made some investigations in regard to the progressive virulence of the cholera spirillum, in connection with those carried on by Gamaleia last year, as found to occur in the transmission of the disease from guinea-pigs to pigeons. While obtaining positive results by inoculating from guinea-pigs to pigeons, they were never able to transmit the disease from pigeon to pigeon.

E. Klein[1082] has put before the public the reasons that seem to him to be sufficient for denying that the cholera spirillum is the effective factor in the production of Asiatic cholera, but they are too many and diffuse for more than a reference to them here. Rosenfeld$^{50}_{\text{Oct.15}}$ has shown the existence of a new form of "comma bacillus" which he isolated from the pus of a case of empyema. It grows well on the ordinary nutrient media, and produces a marked orange color, with a slow liquefaction of the gelatin. In the early part of its growth it appears as a short, ovoid bacillus, often two or three together; the "comma" form appears about the fourth day, and in the older growths the cultures seem to be made up of circular granules. They are non-motile, stain easily, and lose their vitality after seven minutes' heating at 80° to 90° C. (176° to 194° F.). Agar, milk, and gelatin cultures give out a putrid odor. No pathogenic properties were found.

Bacillus Capsulatus.—Under this heading Pfeiffer$^{58}_{\text{Apr.12}}$ describes an organism which he found in guinea-pigs which had died without any artificial inoculation. It was found in the peritoneal exudation and in the blood, and occurs as a well-marked bacillus, plump, and with rounded ends. The single bacilli are twice and three times as long as broad, and not infrequently occur as threads of two or three joined together, end to end,—not infrequently, also, as longer threads, in which case the separation into the single individuals is not possible. In dried cover-glass preparations the bacilli are seen to be surrounded with a capsule, whose breadth is to the length as three is to five. It may be stained with the ordinary aniline colors, and when these are hot the bacillus itself is obscured, but may be again made visible by decolorizing with dilute acetic acid. It may be also stained with Gram, and the author calls it the B. capsulatus. There is only the slightest hint of the capsule in the hanging-drop cultures, and no motion has been made out with certainty. It grows with ease on all the ordinary nutrient media; on agar-agar, within twenty-four hours, it appears as a thick, white layer, very much like the colony of the micrococcus tetragenus. On gelatin plates the first growth is seen in from twenty-four to thirty-six hours. The colonies have no very characteristic appearance, being small, white, round, or oval points, the size of a pin-head, and finely granular under a low power. In gelatin needle cultures the growth resembles that of Friedländer's pneumonia bacillus very much. It is non-liquefying, produces gas with no odor, and has not been seen to produce any spores. It grows on potato as a moist, glistening, white layer. It is very pathogenic to house- and white mice, and is facultatively anaërobic. It may be differentiated from the pneumonia bacillus by the fact that it does not have the cocci forms of that organism, and that it is pathogenic to mice; and from the "pseudo-pneumonia bacillus" of Passet, because it is exceedingly aërobic, and also because this bacillus is so widely distributed through the blood-vessels and lymph-channels.

PERITONEAL EXUDATION FROM A GUINEA-PIG AFTER INTRA-PERITONEAL INOCULATION.
× 1000.
(*Zeitschrift für Hygiene.*)

Corn-stalk Disease.—Billings$^{170}_{\text{July to Sept.}}$ gives a description of the organism found by him in this affection of cattle. It is ovoid, with rounded ends, and about twice as long as broad, being about one-sixth the diameter of a red blood-corpuscle in length, and stains better at the poles than in the centre. It grows well and most characteristically at the temperature of the room; on potato, as grayish-white, somewhat elevated colonies; on white of egg, as a clear, yellow colony with somewhat raised edges; on agar-agar, as a grayish-white colony with escalloped edges, and with rays shooting out from the track of the needle, which finally become joined together; the culture is dry and adheres to the surface of the agar-agar closely. On gelatin it develops very rapidly on the surface, with leaf-like extensions. It is pathogenic to mice, guinea-pigs, and rabbits. The especial points about the organism are the difficulties of separating it from the ones concerned in swine-plague, and cattle-fever (Southern).

Carcinomata.—In regard to the organisms connected with malignant growths, Verneuil$^{100}_{\text{Sept. 17}}$, comes to the following conclusions in regard to the work that has been done upon them: 1. The tissue of malignant growths may be invaded at any time by various bacteria, whose origin, kind, or number cannot be accurately determined. 2. This invasion, whose causes and mechanism are equally unknown, may remain for a longer or shorter time latent, but it may also, in certain cases, give rise to various modifications in the progress of the tumors, such as rapid growth, softening, or ulceration. 3. The organisms are not found in all growths, nor in all of the same kinds, and not even in all parts of the same growth. They are not found, for example, in lipomata, nor in pure fibromata, nor in commencing carcinomata, with slow growth, covered with healthy skin; on the other hand, they are seen almost constantly in softened or ulcerated neoplasms. 4. These bacteria, besides the irritant phlogogenic and pyogenic action which they exercise locally upon the tissues of the invaded tumor, have other pathogenic properties which may involve the entire economy. Thus, they are apparently capable of setting up a more or less intense or irregular fever, even while they are shut up in the tumor which they have first invaded. Further, they can, during the ablation of the tumor which contains them, mixed up with the fluids contained in the softened points, spread through the operating wound, contaminate it, and so infect and inoculate it as to produce the development of a septicæmia capable of producing death. 5. The knowledge of this fact, besides pleading for the early ablation of these growths, which is desirable from all points of view, gives certain hints to surgeons in regard to the treatment of tumors infected with bacteria, before the ablation as well as afterward.

Upon the same subject, Thoma,[54 June 1] speaks of certain small cell-like bodies which he has found in considerable number in the muscles of carcinomata of the rectum, stomach, and mamma, and he is inclined to consider these organisms as decidedly parasitic. They are unicellular, have protoplasm and nucleus and sometimes a nucleolus, and stain with various reagents, *i.e.*, hæmatoxylin, eosin-saffron, and alum-carmine. They are irregularly rounded or, more commonly, oval, and sometimes whetstone-shaped. As a rule, they are strongly refractive. They occur singly, or in groups of four or six in an epithelial nucleus, in which case the nucleus seems like a bladder, with granular bodies besides the parasites. In other cases a little cavity appears closely applied to the nucleus, and it is in this that the minute unicellular organisms are found. In birds, epithelial tumors are produced by similar bodies, and the inference might be made that the same was the case in the human body, but a much more careful study must be made of the matter before the theory is accepted as proved.

The search for the organism that may be the cause of malignant disease has been well summarized.[25 June] The author remarks that the success of the various observers seems to be in accord with their care in avoiding all the complications that may arise. As a result, the conclusion seems to be forced upon us that the true organism of this process is not yet isolated. Successful inoculations of carcinomata from man to dog have been made in several instances, as related by Hanau.[9 June 15] Braun[50 Jan. 18] has taken up the branch of the subject involved in the examination of the blood of various kinds of cancer for parasitic infusoria, and details the peculiarities found in this situation.

Cereals.—In regard to the bacteria of this class of plants, Lehmann[34 Feb. 12] gives the results of his work, showing that they are mostly free from them, and also summarizes the work of others in the same direction.

Coffee.—In a very interesting series of experiments by Luederitz,[58 Nov. 7] coffee is shown to be useless as a germicide, even in a very strong infusion.

Tavel[214 July 1] has given an interesting case illustrating the action of the bacterium coli communis as a pathogenic organism. To prove that infection occurs from the intestinal tract, proof is required that after the wound is sewed up there are no bacteria left in the wound, and also that the same wound contained bacteria afterward; this he thinks he has shown in the case spoken of.

Diphtheria.—Roux and Yersin[80 Mar.] have shown that bouillon in which Loeffler's diphtheria bacillus has grown, and which has been passed through unglazed porcelain filters, shows the presence of a poison which is capable of producing the same results upon inoculation as the pure cultures of the bacillus itself. Zarniko, working upon the same organism, obtained a number of positive results that enabled him to say that this bacillus (of Loeffler) is the cause of epidemic diphtheria, in spite of many assertions to the contrary. Chantemesse and Widal[161 Sept.] record the result of their work as to what will most easily and effectively destroy the bacillus of diphtheria. The only three substances which actually checked and destroyed its vitality were phenic acid (5 per cent.), camphor (20 per cent.), olive-oil (25 per cent.), in combination. For the last the authors substitute glycerin, because this allows the mixture to penetrate farther into the mucous membrane than oil, the latter favoring a tendency to pass over the surface. This mixture, when heated, separates into two layers, the upper one viscid and forming a sort of "glycerole," and the lower clear. The latter will completely sterilize a thread dipped in a pure culture of the diphtheria bacillus. Corrosive sublimate was not examined, because in strong enough doses it would be dangerous, and in weak ones it would be useless.

Earth has also been the object of a thorough study, in regard to its behavior toward and the number of bacteria that it contains, by Reimers,[58 Nov. 7] and a number of interesting facts were brought out by him,—notably that the earth does not contain so many micro-organisms as is commonly supposed.

Erysipelas.—The facts obtained in regard to the streptococcus of this disease by Traversa and Manfredi[67 Feb. 16] are summarized as follows: that both clinical and experimental evidence teach the extreme ease of a renewed attack of the disease; that it is possible to kill guinea-pigs by an intoxication, when they are, as a rule, immuned to an inoculation of the culture in ordinary quantities; and this fact should warn the experimenters trying to obtain immunity in man by the inoculation of non-pathogenic bacteria, because the same result may be reached,—the unexpected intoxication of the system.

A new theory in regard to *fever* and the relation of micro-organisms is suggested by Roussy[12, Sept.]: that it is a fermentation produced by a diastase or soluble ferment elaborated by all micro-organisms and cells, and which they use in attacking and transforming matter, either inside their substance or without it.

Gonococcus.—Neisser[113, July 14] gave an interesting talk upon the organism that is connected with his name, and showed anew the reasons for considering it the specific cause of the process. That it is the cause being granted, the method of staining it given by Schütz[34, No. 14] is of practical importance. It is as follows: The cover-glasses are prepared in the usual manner and stained for five to ten minutes in a saturated solution of methylene blue in 5-per-cent. carbolic-acid water. They are then dipped for as long as it takes to count one, two, three, slowly, in a solution of 5 drops of acetic acid in 20 cubic centimetres (5½ drachms) of water, and are then washed carefully in clear water. The gonococci and the epithelial cells are the only things that are now colored, and a contrast stain may be obtained by using a dilute solution of safranine. Thus a double stain of the gonococcus may be obtained,—which has not been successfully done before.

An epidemic of *green sputum* occurring in the Cantonal Hospital is described by Fricke,[214, May 30] and a bacillus was found in it, which, upon being grown in the ordinary nutrient media, showed no color, but upon being placed in fresh sputum it produced the same green color which was first noticed. It resembles in size the bacillus of typhoid, and is very motile. It is aërobic and has no pathogenic properties. It was shown to be different from other forms of green, pigment-producing bacteria, already described, and therefore seems to be a new variety.

Gregarineen.—The possible importance of this class of organisms in the pathological processes in man must be the excuse for an extended notice of the work of Pfeiffer[58, Jan.] on their occurrence in birds,—a continuation of the work mentioned in this article last year. The subject seems to be of so much importance that his conclusions are given at length. They are as follow: By the pathological anatomy and the microscopic examination of the epitheliomata and of diseases of the mucous membranes in birds, it is seen that they have a great similarity to, but are not identical with, diphtheritic croup, tuberculous diphtheria, or with variola. The

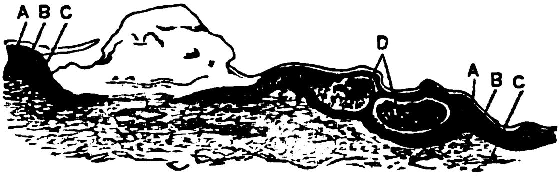


FIG. 1.—POINT OF INOCULATION OF PIGEON-POCK IN THE CRISTA GALLI; MILLET-SEED-SIZED NODULE AFTER TWELVE DAYS. (× 52.)

A, horny layer; B, rete Malpighi; C, corium and subcutaneous tissue; D, cavity with degenerated products and parasites. Hæmatoxylin picric-acid staining.

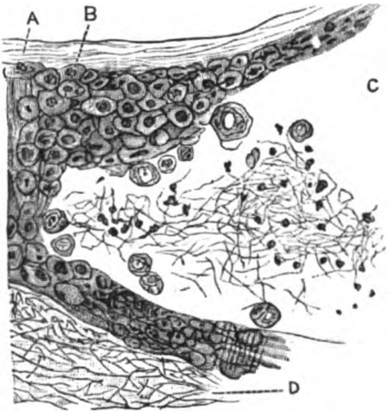


FIG. 2.—CAVITY D IN FIG. 1. (× 500.)

A, horny layer; B, rete Malpighi; C, cavity with degenerated products (fibrin-nuclei) and parasites; E, corium.

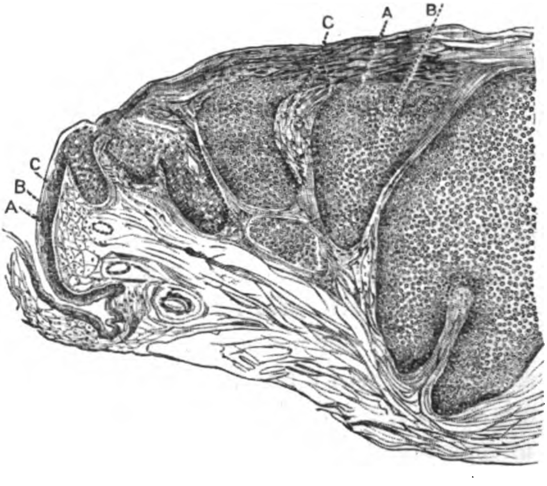


FIG. 3.—PIGEON-POCK BORDERING ON NORMAL TISSUE. (× 50.)

A, horny layer; B, enlarged papilla of the rete Malpighi; C, corium and subcutaneous tissue.

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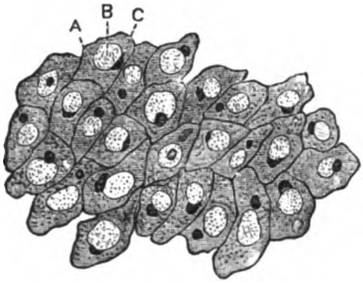

Fig. 4.—Epithelial Nodule of Pigeon-Pock. (× 500.)

A, epithelial cells; B, parasites; C, cell-nuclei.

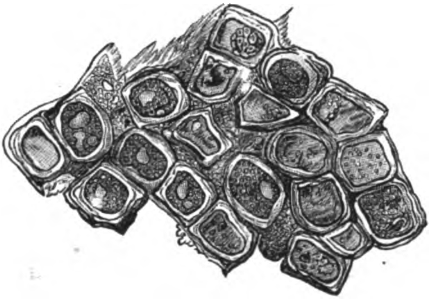

Fig. 5.—Inoculated Cartilage-Nodule from the Beak of a Young Pigeon. (× 500.)

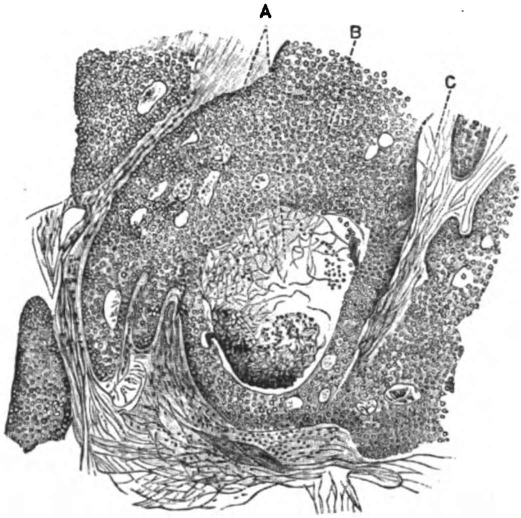

Fig. 6.—Old Pigeon-Pock; Cavity in the Epithelial Nodule with Degenerated Products. (× 50.)

A, cavity with fibrin-nuclei; B, papilla of the rete Malpighi; C, subcutaneous tissue.

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special signs of diphtheritic croup are present,—the exudation and the thickened mucous membrane,—but the febrile stage is absent in birds. The chronic course and the common metastasis to cartilage and bone are also absent. By the inoculation of the exudation from birds, and of cultures of the bacilli obtained from it, there was obtained an infiltration, but without the production of any characteristic process or the appearance of the dry or half-dry exudation. Thus, between the diphtheria of calves and that of birds there is a marked difference, according to Loeffler and Dammann. The author goes on to quote the work of several writers on the subject of cattle-plague,—Weigert on the anatomy of small-pox, and others on variola, vaccine, varicella, and zoster,—and to point out that they all mention having seen bodies that, to them, appeared to be the detritus of epithelial cells or giant-cells, and that these bodies were very probably the gregarineen and protozoa of various kinds that he has found to be active in the production of the above-named diseases in birds. He goes on to say that the bacteria found in these processes are probably intercurrent, and that the *general* symptoms of the disease may be due to their activity and not the special ones, and that this probably accounts for the failure to produce the specific process by the aid of pure cultures of these organisms.

Germicides and antiseptics for each bacterium are thus summed up by C. Paul$^{164}_{\text{Sept.12}}$: There is first a list of substances that have had their antiseptic powers tried, and they are classified according to their power. Then follows a list of the substances that may be used for special bacteria. The typhoid bacillus is prevented from developing by corrosive sublimate (1 to 20,000), sulphate of quinine (1 to 800), carbolic acid (1 to 200), hydrochloric acid (1 to 100), chlorinated lime (5 to 100). The cholera spirillum will not develop in an acid medium. A drop of a 1-per-cent. solution of HCl will prevent its growth. Other agents are as follow : corrosive sublimate (1 to 100,000), sulphate of quinine (1 to 5000), sulphate of copper (1 to 500), carbolic acid (1 to 400). The bacillus of tuberculosis is sterilized by the following: hydrofluosilicic acid, ammonia, fluosilicate of iron, fluosilicate of potassium, polysulphide of potassium, silicate of soda. Small amounts of the following have an inhibitory action upon the same bacillus: acetate of soda, arsenious acid, boric acid, methylic alcohol, nitrate of potash, benzine, creasote, chloroform, ether, hyposulphate of soda, picric acid, pyrogallic acid, sulphurous alcohol, ethylic alcohol, iodoform, menthol, nitrobenzine, salol, sulphate of aluminium, toluine. In solutions of the following substances development occurs with difficulty: acetanilide, acetone, aldehyde, ammoniacal alum, chromic alum, caffeine, chlorate of potash, chloride of aluminium, lactate of zinc, sulphate of soda, sulphate of zinc, arsenite of soda, nitrate of potash, bichromate of ammonium, biniodide of mercury, spirits of turpentine, eucalyptus, iodide of potassium, resorcin, sulphate of soda, terpin. The following substances do not hinder the development of the bacillus of tuberculosis: benzoic acid, salicylic acid, uric acid, benzoate of soda, biborate of soda, bromide of camphor, chloral, urethane.

Tuberculous material, heated for twenty minutes to 60° C. (140° F.), ten minutes to 71° C. (159.8° F.), or completely dried at 30° C. (86° F.), infects guinea-pigs as quickly as fresh material. Morsels of tuberculous material, left to macerate in water or to putrefy in the same at ordinary temperature, for five to twenty days, or frozen and thawed successively, retain their infectious qualities. Typhoid bacilli develop at a temperature of 40° C. (104° F.), better where the temperature is 25° to 30° C. (77° to 86° F.); at 46° C. (114.8° F.) the growth ceases. They retain their vitality for a long time. Cultures are still active after six months. The spores endure a long desiccation and they easily resist freezing. Cholera spirilla have a feeble vitality. Cultures perish after a half-hour at ordinary temperature. In liquids, 50° to 55° C. (122° to 131° F.) is enough to kill them. Cholera spirilla do not flourish in sterilized water. Water rich in organic matter is most favorable to them: the temperature of 30° to 40° C. (86° to 104° F.) suits them best; below 16° C. (60.8° F.) development ceases. They endure a freezing temperature for one hour. The pneumo-bacillus of Fränkel does not develop below 24° nor above 42° C. (75.2° and 107.6° F.); it likes best 35° C. (95° F.). Its vitality is very feeble.

Hernia.—Clado[2] has found a bacillus in a case of hernia during operation, and, because he was able to show its pathogenic properties as regards some of the lower animals, he concludes that death in cases of hernia results from the activity of an organism whose normal *habitat* is the surface of the intestine!

In an article entitled "*Hypothetical Treatment by Bacteria*"—

meaning the same thing as "bacterio-therapeutics"—Semmola[22, Oct. 30] has voiced the remonstrance that has been made so often against the attempt to treat patients by the germicidal method. He speaks of the necessity there seems to be for warning the enthusiastic clinician against attempting too much in this direction. A little reflection will show the thinking man that some such warning as this is sadly needed. So, too, it does no good to use the materials suggested by laboratory work in dilution, for then their effectiveness is lost and the patient is worse off than if the true methods of healing had been adhered to in the first place,—food and nursing.

Ice in its relation to bacteria has been investigated in another study by Russell,[9, Aug. 17] the work having been done with the ice coming from Lake Mendota, Wisconsin. His results are, briefly: 1. There were no pathogenic bacteria found. 2. The percentage of decrease in the number of bacteria produced by freezing was from 50 to 95 per cent. 3. It was not possible to determine the proportion between the bacteria in snow and transparent ice with accuracy. 4. A number of varieties were obtained from snow,—a greater number from snow that had lain on the ground for a length of time and less from snow at the end of a storm.

Kephir is spoken of by Beyerinck, of Delft,[3, May 29] who says, of the two organisms that make up the action of this well-known ferment, that the first is the *saccharomyces kephir*, and determines the alcoholic fermentation of sugar of milk, and that the second is the ordinary lactic-acid ferment, which serves also the purpose of protecting the first from the action of other bacteria, which are, of course, common in milk.

Buchner[84, Jan. 1] has an article in regard to the relation of bacteria to the surface of the lung, and Wyssokowitsch[84, June 4] sums up his conclusions on the same subject as follows: 1. Micro-organisms, when not pathogenic, are, for the most part, removed from the lung by the expiratory act and the ciliated epithelium of the bronchi. 2. Bacteria which have entered the alveoli go sometimes into the neighboring lung-tissue, or (3) sometimes into the neighboring lymph-glands. 4. In the lungs, as well as in the lymph-glands, non-spore-bearing bacteria quickly die. 5. Neither these bacteria (non-pathogenic) nor their spores pass into the blood or the parenchymatous organs. 6. Bacteria with toxic properties can set up in the lung such an inflammatory process that their passage to the bronchial glands is hindered, and all the pneumonias which arise from septicæmic bacteria can only have a lethal end when they pass on to a general infection. 7. It can be concluded with certainty that the pathogenic bacteria which produce in man a chiefly local and primary process, like the cholera spirillum or the typhoid bacillus, cannot enter the system from the lungs.

Malaria.—The resemblance of the malaria parasite to that of recurrent fever is thus noted in the work of Sacharoff.[586 No.1] He states that there exists in the blood of those suffering from recurrent fever a hæmatozoon, which is most prominent after the fever has begun to fall, and which then has enormous proportions,—twenty and more diameters of a red blood-corpuscle,—although smaller ones may still be found. The parasite consists of a delicate amœboid body, containing a multitude of dark, round, uniform, sharply-outlined, movable granules. Besides these, the protoplasm contains a generally grayish homogeneous nucleus as large as one or two red blood-corpuscles. The protoplasm sends out pseudopodia (without granules), which sometimes separate from and appear as small, delicate pieces of protoplasm. They vary in size, and are often swallowed by the red blood-corpuscles, in which they grow, and finally develop into the above-mentioned large amœboid bodies. Sacharoff calls the large protoplasmic lumps described by Ponfik, the same as his parasite, the "hæmatozoon febridis recurrens." He declares that the granules in the protoplasm which Ponfik took for fat are mostly pigment, and not fat. From time to time the protoplasm itself sends forth pseudopodia in which no granules are to be found; these pseudopodia fall off and circulate freely in the blood by separating from the protoplasm, and the parasites themselves become smaller, until, finally, only the nucleus and the narrow zone of protoplasm containing granules remains. The nucleus itself is round and of a delicate gray color,—even reddish, sometimes,—and Sacharoff considers that it is a red blood-corpuscle. The nucleus sends out pseudopodia, or buds, which separate from it and also circulate freely. Sacharoff watched such separated pseudopodia, and noticed successive changes in them. He saw spirochætæ-shaped threads formed from nucleus pieces in from eight to ten hours; they did not show any small undulations and were not very thin, but large undulations were distinctly visible; he thinks this is probably the genesis of spirochætæ. The lumps separating from the protoplasm do not remain with no further development; they have a motion of their own, attach themselves to the red blood-corpuscles, send buds into them, and, finally, are completely enveloped by them. Here they may assume various shapes, and may grow larger and gain granules of pigment in the protoplasm; they distend the blood-corpuscle containing them and seem to be able to cause its disappearance. On the other hand, they seem to be able to emigrate freely from it. Immediately after the crisis of the fever, the three first-named forms exist in large numbers; further on, during apyrexia, the intra-cellular forms are principally or exclusively to be found. This is the main difference between it and the plasmodium malariæ, whose intra-cellular forms are found only during the fever. If these observations should be confirmed we should have reliable means for the diagnosis of the disease during apyrexia, because the intra-cellular forms are easily stained with methylene blue and are easily seen, whilst those of intermittent fever are not found during apyrexia.

The bacillus of *red milk* was found by Baginsky$^{89}_{\text{Mar. 14}}$ in the fæces of a child sick with diarrhœa, and was shown by him to be identical with that described by Grotenfelt$^{54}_{\text{No. 3}}$ as having been found by him in milk.

In *moor-fowl*, Klein$^{50}_{\text{May 17, July 8}}$ found first an epidemic which closely resembled chicken-cholera, and then isolated an organism which differs from the bacterium of that affection. It is a round or oval coccus, sometimes appearing as a rod, and growing in all the ordinary nutrient media; it is non-motile, and non-pathogenic to chickens, pigeons, or rabbits, but is extremely virulent to mice and guinea-pigs.

The *Bacillus maidis*, asserted by Cuboni to be the cause of pellagra, has been the subject of investigations by Paltauf and Heider,$^{54}_{\text{Sept. 15}}$ who have reached the conclusion that it is but a complication of the disease, and has nothing to do with it from a pathogenic point of view.

The *motility* of micrococci, which has always been a disputed question, has apparently been settled in the affirmative by Ali-Cohen$^{50}_{\text{July 8}}$ in an article in which he describes a micrococcus, which he claims to be possessed of active power of motion, and this distinctly differing from any so-called "brownian" movement.

Milk is shown to be capable of carrying the infection of tuberculosis by Hirschberger,[34 Oct. 22] in a series of microscopic and inoculation experiments, and blue milk is well studied by Scholl.[54 Nov. 1] The author gives the result of some very elaborate investigations in regard to the active agent in producing the change, and concludes that there is a distinct chemical compound to be isolated from the coloring matter.

Musk.—A bacillus which produces the odor of musk is described by Kitasato.[50 Mar. 6] It was found in an infusion that the author made, and allowed to stand in a vessel plugged with cotton-wool for a long time. It is a bacterium, and grows freely on all ordinary nutrient media, as well as on all sorts of infusions, and also especially well upon rice, bread, and potato mixtures. At first there appears a white mycelium and then a red color, and, after five to eight days, it becomes brick-red. In all the cultures the smell of musk is especially marked, but particularly in bouillon and in corn infusions. It liquefies gelatin slowly. The single bodies are moon-shaped, and it does not grow above 30° C. (86° F.). It has no pathogenic properties.

Mussels, investigated by Lustig,[17 July 1] have been found to contain two kinds of bacteria, the one harmless and the other also harmless, when injected into the veins of animals, but producing death, when placed in the stomach of rabbits and guinea-pigs, after from twelve to twenty-four hours.

The *Bacillus mesentericus vulgatus* (potato bacillus) has been very completely studied by Vignal,[208 Nov. 9] and many new facts in regard to it have been brought out, but he did not reach any conclusions of general application.

Oxidation in the earth is considered by Schulz[34 Aug. 6] from the chemical point of view, and micro-organisms are shown to be very active factors in the process.

Puerperal fever has been discussed by Mironoff,[586 No. 30] and his conclusions are the same as those enunciated by the author of this paper in an article on "The Etiology of Puerperal Fever"[1044 v. 2]: that puerperal affections may be divided into two classes, one of which embraces specific cases which are caused by the penetration into the genital tract of certain pathogenic bacteria, and the other of which is caused by the absorption into the circulation of ptomaines elaborated by certain putrefactive and non-specific bacteria.

The biology of the *phosphorescent bacillus* has been elaborated by Tollhausen and Lehmann.[84 Mar. 26; 50 June 7] They find (1) that light-producing cultures always contain living bacteria; (2) that all germicides destroy the light as well as the bacteria; (3) the light remains at low temperatures, showing the resistance of the bacillus to cold. Alkaloids, like morphia, strychnia, and caffeine, have no hurtful effect upon the production of the light.

Pleomorphism has received some support from the investigations of Metschnikoff,[262 No. 3] who has found an organism to which he has given the name of "*spirobacillus Cienkowski*," and which he has observed as oval bacteria, straight bacilli, large crooked bacilli, spirilla, small crooked bacilli, thin threads, and spores. All of these forms develop, the one from the other, but the observations will have to be repeated by other observers before the *dictum* of the German School can be upset—that such changes in the same organism are impossible, if it be a true bacterium.

Banti[376 Feb.] has found Fränkel's *pneumo-bacillus* in a case of cerebro-spinal meningitis, in one of cerebral meningitis, and in one of pleurisy and peritonitis accompanying cancer of the stomach.

Petrone[376 Feb.] concludes that the pneumo-bacillus of Friedländer has no pathogenic properties as regards the production of pneumonia, for the following reasons: (1) that it is not constant in occurrence; (2) because it appears to be identical with the organism found in blenorrhagia, tuberculous meningitis, and various abscesses; (3) because it is found in the expectoration of various pulmonary maladies, and even in normal sputum; (4) because upon inoculation it gives only a local result in the lung; (5) and, finally, because it gives such varying results when inoculated in other places.

A new method of staining the pneumo-bacillus of Fränkel is suggested by Gabbi.[50 June 7] To 100 cubic centimetres (3⅓ ounces) aq. dest., add 5 grammes (77 grains) acid. carbol., and to this add 15 cubic centimetres (4 fluidrachms) absolute alcohol. In the liquid thus prepared are dissolved 1 gramme (15 grains) fuchsine, and then filter. (Gentian- or methyl- violet may be used, but do not give as good results as fuchsine.) Cover-glasses are prepared in the usual way, and a drop or two of the solution allowed to fall upon it and to remain for from a few seconds to a minute. Wash with distilled water gently, so as not to diminish the coloration too much, and the slides are then ready for examination. The "diplococcus" is stained a deep red, and the capsule more or less red, according to the time and care employed in washing the preparation. If the washing is too prolonged, the color of the capsule disappears; it is deepest when the exposure to the coloring fluid is long and the washing is very short. In those points where the sputum is thick the coccus only is stained, and the capsule remains unstained, but with a very distinct outline.

Netter[426 Mar. 9] has come to these conclusions in regard to the transmission of pneumonia from the mother to the fœtus in man and the lower animals: 1. The pneumonia bacilli can, like other bacteria, travel from the mother to the fœtus through the placenta. 2. Among rodents this passage seems to be constant. 3. In man the pneumonic infection may remain local, and this is probably the common state of affairs, but the fœtus is none the less in danger from the overcharging of the placenta with blood and the excess of carbonic acid in the latter. 4. But the pneumonia is often infectious, and in this case the blood of the mother contains the bacilli, and they may be transmitted from her through the placenta to the fœtus. 5. There must, then, be acknowledged a general infection with no local inflammation, and bacteriological examination must be the only means to show a transmission. 6. Under the influence of different causes, this infection can be accompanied by a varied localization of inflammation,—and especially of pneumonia,—but for this the infant must have breathed. 7. What is true of pneumonia is also true of other affections in the mother, of a pneumonic origin. A suppurative meningitis, an ulcerative endocarditis, etc., may equally produce infection in the child.

Pneumo-enteritis of Pigs.—An exceedingly important communication on this subject is made by Galtier,[3 Apr. 24] who, referring to his former article, in which he established that a pneumo-enteritis which occurred among some pigs in the lower Alps was transmissible to other animals of the farm, goes on to speak of more recent work upon the subject. Effects were produced in sheep, goats, dogs, birds, rabbits, and guinea-pigs by cultures brought from the animals first infected, and the same results were obtained from material obtained in two other epidemics. Since the first paper the author has been continuing his investigations on calves, goats, and asses, producing the disease not only by ingestion, but by the ordinary means of inoculation. His results seem to him to indicate that there is a bacterial pneumo-enteritis existing among pigs which can be transmitted to all the other animals on the farm, and which can occasion the "epidemic abortion" among them and the "typhoid affection" of horses as well. This communication is of great importance if the observation should be confirmed, for the cause of epidemic abortion among cows has been the source of much anxiety to farmers, and the possibility of the transmissibility of pneumo-enteritis to other animals has not been as well recognized as would seem to be necessary. Another very important paper on the same subject is that of Cornil and Chantemesse,[165 Nov., Dec., '88] in which they give an exceedingly accurate history of the work done upon the disease, together with an account of their own work upon an epidemic occurring at Gentilly. They tried many germicides upon the cultures there obtained; they found that the bacteria lived after freezing with no apparent difficulty, and that drying only destroyed them after some time, and that they also lived for a long time in an atmosphere of sterilized air. They succeeded in rendering guinea-pigs and rabbits refractory by a method of attenuation of the virus, obtained by prolonged heating and cultivation. It is known, say these authors, that there are described a series of bacteria that are very closely related in their behavior upon culture media, and which are all pathogenic to pigs and other species of animals. They have been isolated and described by different authors and in different countries, and the confusion in regard to them is not, therefore, surprising. In this series of oval organisms—small, taking color better at their ends than at the centre, growing slowly on gelatin and not liquefying it—would be included the organism of chicken-cholera (Cornil and Toupet), of rabbit-septicæmia (Koch), of swine-erysipelas (schweine-seuche of Loeffler and Schute), the swine-plague and hog-cholera of Salmon, of pneumo-enteritis (Cornil and Chantemesse), the same authors' microbe of the epidemic of Marseilles, the deer-plague (Bollinger), and probably the bacillus of Barbone, described in Italy by Oreste and Armani. It probably is not to be considered that Hueppe is right that all these organisms are the same, with their virulence altered by the changes in circumstances. The authors give a very clear idea of the pathological changes taking place in their cases, and discuss the methods of treatment, and especially of prophylaxis. After advising the most thorough cleanliness and washing of the infected pens, they suggest the use of the following solution: Water 100, carbolic acid 4, hydrochloric acid 2 parts, as being the most effective they have yet found. Inasmuch as the organism is destroyed by 50° C. (122° F.), they do not absolutely advise against the use of the flesh of animals affected with the disease, but they do urge very strongly that no part of the intestine should be used for food. In spite of their partial success in protective inoculation, they conclude by saying, with unusual modesty, that the results are not sufficiently definite for generalization. Bleisch and Fiedeler[58 H.] investigated a number of cases of the disease occurring in an epidemic in upper Silesia, and isolated a bacillus from the affected swine. They say that, up to a few years ago, there was a great deal of confusion in regard to the disease, but that now there are known three plagues, which are named swine-erysipelas (schweine-rothlauf), infectious pneumonia of pigs (schweine-seuche), and hog-cholera (schweine-pest). They quote the differentiation of Schutz in regard to them as follows: 1. Erysipelas of swine is a disease in which one obtains only general infectious phenomena, as in splenic fever, septicæmia, etc. The most important anatomical features are enlarged spleen, hæmorrhagic inflammation of the digestive tract, hæmorrhagic inflammation of the kidneys; parenchymatous inflammation of the liver, heart, and muscles; reddening of the skin, and a small collection of fluid in the body-cavities. 2. Infectious pneumonia of pigs (schweine-seuche) is an inflammation of the pleura, associated with necrosis of portions of the lungs and slight infectious indications; enlargement of the spleen is absent or slight; slight cloudiness of the large parenchymatous organs; catarrh of the intestinal tract. If the disease pursues a chronic course cheesy degenerations occur in the lungs, which extend like tuberculosis, and may produce similar appearances in the lymphatic glands, joints, etc. Caseous changes in the mucous membranes of the stomach and gut have not been observed. 3. Hog-cholera (schweine-pest) is a disease of the digestive apparatus in which the large intestine is especially implicated. As a rule, this is the seat of a deep, penetrating diphtheria. At the same time the adjacent lymphatic glands suffer, and the appearance of a slight, general infective process are present.

The disease is often attended with inflammatory processes in the lungs. The authors then conclude with some advice in regard to prophylaxis, which does not differ materially from that already given in the articles spoken of above.

Pseudo-tuberculosis of rodents is discussed by Pfeiffer,[4, Oct. 4] who describes the bacterium concerned in its production as follows: It is a short, thick bacillus, sometimes occurring in two or three together, end to end, and non-motile; it grows upon the ordinary nutrient media, and is destroyed by drying and heating to 60° C. (140° F.). It is pathogenic to rabbits, gray and white mice, marmots, guinea-pigs, and hares. It is non-pathogenic to horses, goats, field-mice, dogs, cats, hedgehogs, chickens, and pigeons. Subcutaneous inoculation, feeding, and inhalation are all successful. It does not stain by Gram. In the discussion which followed Bollinger remarked that the so-called "hare-syphilis" was probably the same or a very similar disease.

Rabies has not had much said about it during the past year that did not tend to prove the truth of Pasteur's assertions of the efficacy of his protective inoculations. The reports from the various stations where his method is employed point toward an absolute demonstration of the fact that there is protection in the procedure advised by him.

Rauschbrand (symptomatic anthrax) and the cultivation of its bacillus is well discussed by Kitasato.[58, Apr. 12] The notable features of his results are that he could not obtain a pure culture upon nutrient gelatin or agar-agar, that it is exquisitely anaërobic, and that it thrives well only in hydrogen and not in carbonic-acid gas. He describes the bacillus as being 3 μ to 6 μ long, and 0.5 μ to 0.7 μ thick,—never growing into threads in culture,—and he thinks that he obtains an immunity against its influence in guinea-pigs.

Bacilli of *aphidæ*, investigated by Krassilstchik,[262, Sept.] were found in 7 out of 20 specimens examined. They seem to have no saphrophytic nor pathogenic influence, nor do they seem to come from the outside, having been observed in the embryos and in the same species as occur in the parents. The author has therefore given them the name of "biophytic" bacteria, to distinguish them from the two ordinary divisions that are commonly known.

Moulet,[8, June] in conjunction with Nocard, has found an organism in *putrefying meat* with the odor of rancid butter, which is very motile, and which, after coloring with methylene blue, appears as if it were a line of intensely-stained spots, with clear interspaces between. In itself it is not pathogenic, but it seems to be associated with organisms which are possessed of extremely virulent powers,—inoculation of the juice from such meat producing death within forty-eight hours in the animals experimented upon.

Bacterium rosaceum metalloides, described by Dowdeswell,$^{50}_{\text{June 14}}$ is one with the power of producing a magenta-red color and the metallic glisten of fuchsine. It is 0.6 μ to 0.8 μ broad and about twice as long, non-motile, and grows well upon the ordinary nutrient media. In fluid culture media it appears much larger than the dimensions given above, and it liquefies gelatin very slowly. It has not been shown to have any pathogenic properties.

Salting meat and its effect upon bacteria have been investigated by Forster,$^{2}_{\text{Oct. 26}}$ showing that the cholera spirilla were soon destroyed under the effect of salt in a few hours, but that other bacteria, such as those of typhoid, the pathogenic staphylococci, the erysipelas coccus, and the bacteria of certain diseases of pork, retained their vitality for several weeks, or even months, in the presence of an excess of salt. Tuberculosis retained its vitality after a considerable time in much salt, but it was found that a 7.5-per-cent. solution would destroy the anthrax bacillus in about eighteen hours. The same proportion was needed for the destruction of the cholera spirillum.

Scarlatina.—The most important article upon this disease comes from the pen of a Russian. Raskina$^{586}_{\text{Nov. 27, 30, 11 to 14}}$—a woman, by the way—obtained her material from a hospital clinic, and examined 86 cases of all degrees of severity of the disease. There was obtained from these a streptococcus, which is thus described: It is in long chains of 20 μ or 25 μ, and mostly of the same size, varying in the numbers in the chain in accordance with the soil, as in otorrhœa, etc.; in cultures the size varies very much. It grows with medium rapidity, and forms round, brown colonies on agar-agar at the temperature of the body. Its especial characteristic is its weak vitality, varying on different media, being from ten days to a month on agar-agar and from three to five days on gelatin. With this exception, the bacterium does not seem to differ much from the streptococcus of erysipelas. The attempts to produce pathogenic effects on animals failed, and the author concludes her article with some theoretical considerations, which may be of importance if they are borne out by future facts.

Some new facts are recorded by Ernst,[58 Jan] in regard to the *spores and granules* found in bacteria. His conclusions are as follow: "Three different methods have shown a new element in several bacteria. This new element stains a blue-black with warm (not hot) alkaline methylene blue and cold Bismarck brown (mixed staining). It stains black-violet with Delafield's hæmatoxylin. It stains black with Platner's granule-black (Kernschwarz). It has been possible, in certain bacteria, to observe the change of these bodies into spores, and therefore the name of "sporogenic bodies" (sporogene körner) has been given to them. It was seen that they did not stain with Neisser's spore-staining method. They are entirely different from spores (besides being their forerunners), and on these grounds: 1. Hæmatoxylin stains them intensely, while it never stains spores. 2. They also stain with Platner's granule-black, although more slowly and with less intensity than with hæmatoxylin. 3. In the earlier stages they are easily peptonized (in three hours with a solution of pepsin, 0.5; muriatic acid, 0.2; water, 100), and then resist digestion much more. True spores are non-digestible. 4. With methylene-blue or Bismarck-brown staining these bodies are stained blue-black (mixed stain); the true spore, a clear blue (double stain). 5. They do not stain by Neisser's method, and rapidly disappear in all kinds of fluids, even in pure water. The bodies are not vacuoles nor fat (resisting boiling ether), nor amyloid (not stained by iodine-iodide of potash). That they are of the nature of cell-nuclei follows from the hæmatoxylin and nucleus-black staining, the relative resistance to digestion in the later stages of development, the method of separation, the possibility of changing into spores, and their occurrence in the oscillaria, in which they are easily peptonized." The author concludes that hæmatoxylin, which has been banished from bacteriological work, may be found to have a special value in such matters as this.

The bacteria of the *stomach* have been studied by Abelous,[108 Apr. 1] who found 16 species in the washing of his own stomach after fasting. They were isolated, and their characteristics were as follow: Twelve of them attack fibrin, 10 albumen, 9 gluten, 10 more or less completely transform lactose into lactic acid, 8 have a converting action upon cane-sugar, 11 have more or less to do with the formation of alcohol from glucose, and 13 assist the formation of glucose from starch. Their combined action upon alimentary substances gives remarkable results. Under such circumstances there is a very rapid and energetic decomposition, with the liberation of gas and the formation of such products as fatty acids and leucin, tyrosin, indol, skatol, with certain ammoniacal compounds. Large quantities of alimentary substances can thus be decomposed at the end of a very short time.

Saccharomyces lactis is a new organism described by Adametz,[50, Jan. 18] which has the power of inducing the milk-sugar change, and differs from Duclaux's yeast.

Bacillus murisepticus pleomorphus was found by Karlinski[50, Feb. 1] in the pus of a case of phlegmonous inflammation of the joints and the case of a lying-in woman dead of septic pyæmia. It varies in different culture media, and with the age of the culture from a fine oval body to a long spirillum, and is easily stained with any of the aniline colors and with Gram. No spores or cilia were seen, but the bacterium has a very active motion, grows upon all the ordinary nutrient media, resists freezing and drying for a long time, and is pathogenic in varying degrees to the ordinary animals.

Certain new forms of *septic bacteria* are described by Babes and Eremia.[836, Oct. 12] They state that in the septic diseases of children there are found three classes of bacteria, the ordinary suppurative organisms, the saprogenic, and the bacteria of experimental diseases (Koch). They also describe four new varieties: the first found in a fibrinous pneumonia; the second in a case of variola; the third in parenchymatous nephritis; and the fourth in a case of gangrene of the lung. All of them were isolated and cultivated and found to be pathogenic to the lower animals, but the authors fail to show that they were pathogenic to man.

Kamen·[57, Nov. 23] recounts a very interesting case of *congenital syphilis* in which he was able to discover the bacilli of syphilis by staining with Giacoli's method, and where the number seemed to correspond with the severity of the symptoms,—diminishing as these abated. Levy[50, May 3] gives the differentiating points between the syphilis bacillus and the smegma bacillus as follows:—

1. The syphilis bacilli are found in the secretions of the various products, as well as in the tissues in all three stages of the disease.	1. The smegma bacilli are found in the preputial smegma of the prepuce and clitoris, between the labia majora and minora, etc.

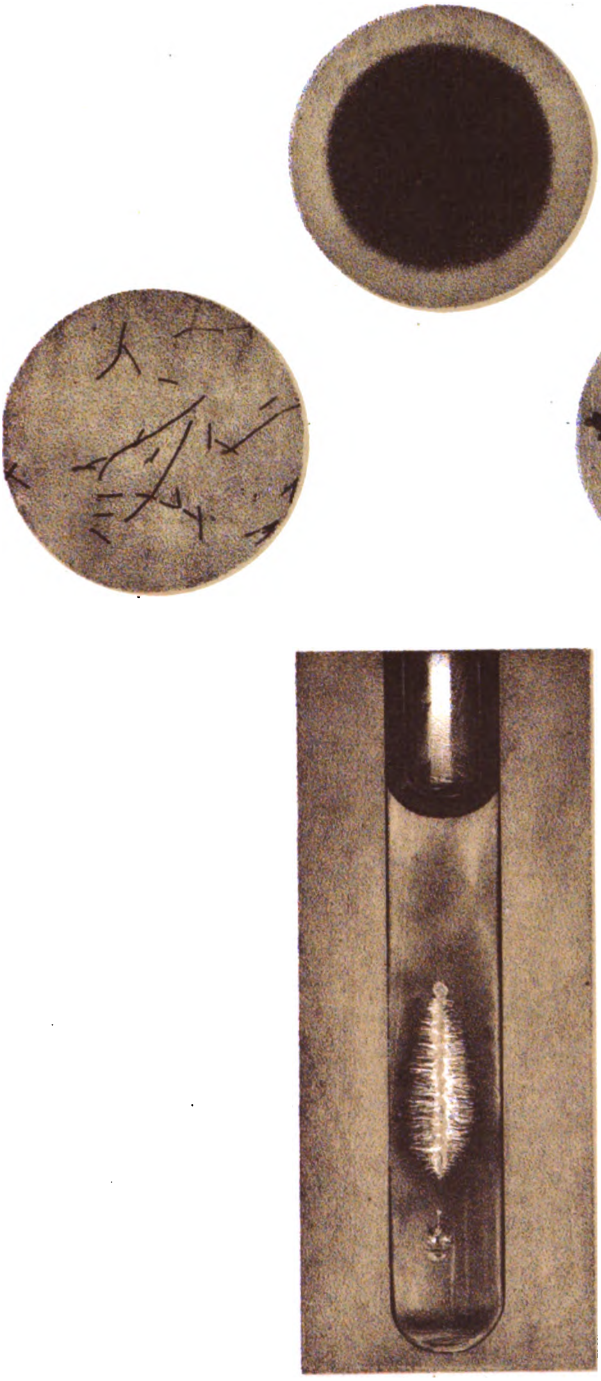
2. The syphilis bacilli are found mostly in the epithelial cells, but occasionally occur by themselves.	2. The smegma bacilli occur either in or out of the cells in large masses.
3. The syphilis bacilli are mostly narrow, straight, or slightly-curved rods.	3. The smegma bacilli occur mostly as small, plump rods, with great variety of form.
4. The syphilis bacilli resist alcohol for rather a long time.	4. The smegma bacilli are very quickly decolorized by alcohol.
5. Acids decolorize the syphilis bacillus in from forty to forty-five seconds.	5. Smegma bacilli resist acids for two minutes and more.
6. Syphilis bacilli are decolorized almost instantaneously by acetic acid.	6. Smegma bacilli resist acetic acid, even for more than five seconds.
7. The younger the infiltration, the more numerous the bacilli.	7. The older the secretion, the more numerous the smegma bacilli.

Tetanus.—The bacillus of this disease has been isolated by Kitasato[58, Nov. 4] by a peculiar method. Pus obtained from a case of tetanus in man was cultivated for a time at 36° C. (96.8° F.), and when all the bacteria were in active development the culture was raised in a water-bath to 80° C. (176° F.), at which temperature the other bacilli were destroyed, but the spores of the tetanus bacilli were still alive. Then the plates were kept at 18° to 21° C. (64.4° to 69.8° F.) in an atmosphere of hydrogen, and pure cultures of Nocolaier's bacillus were obtained. It resists the action of heat very markedly, as may be seen by the facts just related, needing a temperature of 100° C. (212° F.) for full five minutes to destroy it. Belfanti and Pescarolo[50, May 10] have also made out some new facts in regard to the same organism.

Plate IV.—Fig. 1. Colony of tetanus bacillus in an atmosphere of pure hydrogen; × 100 (reduced one-third). Zeiss Apochrom., 16 millimetres, Ap. O. 30. Projection ocular 2. Lamplight, open condenser. Fig. 2. Needle culture of the tetanus bacillus in nutrient gelatin. Natural size by diffused daylight. Fig. 3. Tetanus bacillus from a gelatin culture; non-spore-bearing rods. Cover-glass preparation, stained with fuchsine; × 1000 (reduced one-third). Zeiss Apochrom., 2 millimetres, 1.40. Projection ocular 2. Sunlight, open condenser. Fig. 4. Tetanus bacillus from an agar-agar culture; spore-bearing rods. Cover-glass preparation, stained with fuchsine; × 1000, as in Fig. 3 (reduced one-third).

Illustrations to this article are so good that they are reproduced.

Tuberculosis.—Norderling's method[59, Apr. 4] for staining the bacillus of tuberculosis is as follows: Cover-glasses are immersed in the solution of fuchsine, prepared in the ordinary way, and heated until the steam appears. Then wash in water and immerse in a saturated solution of oxalic acid until completely decolorized; dry, and stain in methylene blue. Pition and Roux[548, Dec., '88] give a rapid method for staining as follows: Sol. A. Fuchsine, 10 grammes (154 grains); abs. alcohol, 100 grammes (3⅓ ounces). Sol. B. Liq. ammon., 3



Tetanus Bacillus (Kitasato)
Zeitschrift für Hygiene.

grammes (46 grains); water, 100 grammes ($3\frac{1}{3}$ ounces). Sol. C. Alcohol, 50 grammes ($1\frac{2}{3}$ ounces); water, 30 grammes (1 ounce); nitric acid, 20 grammes ($\frac{2}{3}$ ounce); add aniline green to the alcohol to saturation, then the water, and finally the acid. For staining, take 10 cubic centimetres ($2\frac{3}{4}$ drachms) of Sol. B; add 1 cubic centimetre (16 minims) Sol. A; heat until bubbles of gas form, and then immerse the cover-glass. In one minute there is a perfect stain of the bacilli. Wash in water, and then allow a few drops of Sol. C to remain on its surface for a few seconds (45); wash and dry. In three minutes they are well-stained, unalterable specimens. Another method is suggested by Gabbett[82, Aug. 10]: Sol. 1 is fuchsine, 1 gramme ($15\frac{1}{2}$ grains); abs. alcohol, 10 grammes (3 drachms); 5-per-cent. solution of carbolic acid, 100 grammes ($3\frac{1}{3}$ ounces). The cover-glass is allowed to remain in this for two minutes, and then transferred to Sol. 2, *i.e.*, methyl blue, 2 grammes (31 grains), dissolved in 100 grammes ($3\frac{1}{3}$ ounces) of a 25-per-cent. solution of sulphuric acid. After remaining here for one minute, wash, dry, and mount in Canada balsam.

Still another method of staining is recommended by Herman.[262, Apr.] The cover-glass is immersed in a solution made up of carbonate of ammonium (1 to 100), to which has been added a solution of crystal violet, or methyl violet 6 B. (1 gramme to 30 cubic centimetres of alcohol, 95 per cent.), sufficient to leave a deep stain upon filter-paper. The bath is warmed until bubbles appear, and the staining is kept up for one minute. Decolorize in nitric acid (1 to 10) and wash in alcohol. If a contrast stain is wanted use eosin. Decolorize sections with nitric acid (1 to 4).

Courmont[3, July 24; 211, July 24] speaks of a form of bacillus capable of producing tuberculous lesions in every way similar to those of true tuberculosis. Solles[188, Mar. 10] gives some results tending to show the possibility of a preventive inoculation against tuberculosis, but the cases are very few. Stschastny[20, Jan.] says, in regard to the relationship of the bacilli of tuberculosis to the cells: 1. That the wandering cells in the blood and lymph currents destroy living and virulent bacilli by phagocytosis. 2. They also carry the bacilli from the blood-current to the tissues, and so set up acute tuberculosis or tuberculous infiltration. 3. The bacilli containing giant-cells are the result of the breaking up of the nuclei of the lymphoid cells containing bacilli. 4. It is not usual for giant-cells to be the result of the breaking up of fixed cells. 5. But the species of animal probably makes a difference in this. 6. The giant-cells of animals susceptible to tuberculosis may form a partial or total necrosis, and may be almost diagnostic of tuberculosis in the case of susceptible animals. The giant-cells of animals not susceptible to tuberculosis—as the shrew-mouse—are, as it were, a physiological process for the defense of the organism. 7. The giant-cells hinder the natural development of the bacilli and give rise to certain "involution" forms (granular condition, changes in staining reaction) that are not seen in cultures, and also there can be seen in cultures forms that are not seen in giant-cells; these latter are also phagocytic. 8. The primary epithelioidal cell-tubercle is not derived from the lymphoid cell-tubercle, but they can both come from the bacilli,—containing lymphoid cells,—the rapidity of the change depending upon the susceptibility of the animal to tuberculosis. 9. Whether primary epithelioid cell-tubercle can change to the fixed tissue-cell form is doubtful, because it is doubtful whether a non-motile bacterium can change to a fixed cell. 10. The amœboid motion of the tissue-cells and the motility of the endothelial cell are responsible for the secondary occurrence of tuberculosis by their embracing and absorption of the lymphoid cells. How far they aid the process by taking up the bacilli is not certain, but they are ultimately, like the cells in the blood, phagocytic. Cornet[9, June 23] studied the mechanism producing tubercular adenitis by inoculating dogs with bacilli. The ganglia of the region into which the virus penetrates are affected first; and his inoculations gave positive results, not only when he had to deal with a spontaneously- or artificially- affected membrane, but also when he inoculated by simple friction on an intact membrane. The investigations of Maffuci[50, Feb. 8] on tuberculous infection of chicken-embryos are of interest. By inoculating eggs he obtained tuberculosis in the chickens after they were hatched in 7 out of 8 cases. Spillman and Haushalter[48, Oct.] have shown the undoubted transmission of tuberculosis by the agency of house-flies,—an important point to know, and to prevent, if possible. The behavior of the bacillus of tuberculosis in the animal body has been worked up by Cornet[50, Nov. 7] in cases of animals affected with tuberculosis and inoculated with 8 germicides,—all said to be of value in the treatment of phthisis. Tannin, acetate of lead, pinguin, sulphuretted hydrogen, menthol, acid corrosive sublimate, creolin, and creasote were used in maximum doses, but with no sort of apparent effect, except to make the animals show symptoms of poisoning. The effect of high altitude was also tried, but with no preventive, and certainly no curative, effects. The milk of cows affected with tuberculosis has been shown to be capable of transmitting the disease even when there is no discoverable lesion of the udder, by Ernst,[5 Nov.] and the experiments seem to show that the danger, instead of being a rare one, is much more common than would be easily believed.

Typhoid.—The most marked advance in the study of this disease has been the increase of the number of cases of the identification of the bacillus connected with it in the sources of epidemics. The statements of Chantemesse and Widal that the typhoid bacillus is capable of resisting the action of carbolic acid, and that thus there is an easy way for separating it from other bacteria in a suspected water, have not been strongly enough corroborated. Uffelmann[50 Apr.16] finds that the typhoid bacillus has a most remarkable resisting power to drying when in the stools, in some cases extending over four months. Janowski[648 July 11] concludes that there is nothing of value from a diagnostic point of view coming from the investigation of the blood for the typhoid bacillus. Rodet[648 July 17] shows that the typhoid bacillus may be sometimes isolated from a suspected water by maintaining it at a temperature of 44.5° to 45° C. (112° to 113° F.), thus killing out the other bacteria that may be present. He does not claim that this method is infallible,—only that it will prove satisfactory sometimes. Karlinski[50 July 12] makes the following statements in regard to the typhoid bacillus: that they appear in the stools coincidently with the breaking down of Peyer's patches, and disappear at the time the stools become solid and the temperature begins to fall; that they will not live more than three months in the stools; that variations of temperature have no appreciable effect upon their growth; and that the presence of liquefying bacteria in the stools has a very destructive effect upon the typhoid bacilli, and causes their rapid disappearance. His general conclusions are (1) that the greater the quantity of sewer contamination and putrefactive bacteria present, the more rapid is the destruction of the contained typhoid bacilli; (2) that the duration of vitality of this organism in sewage contamination is much shorter than that ascribed to it by Uffelman.

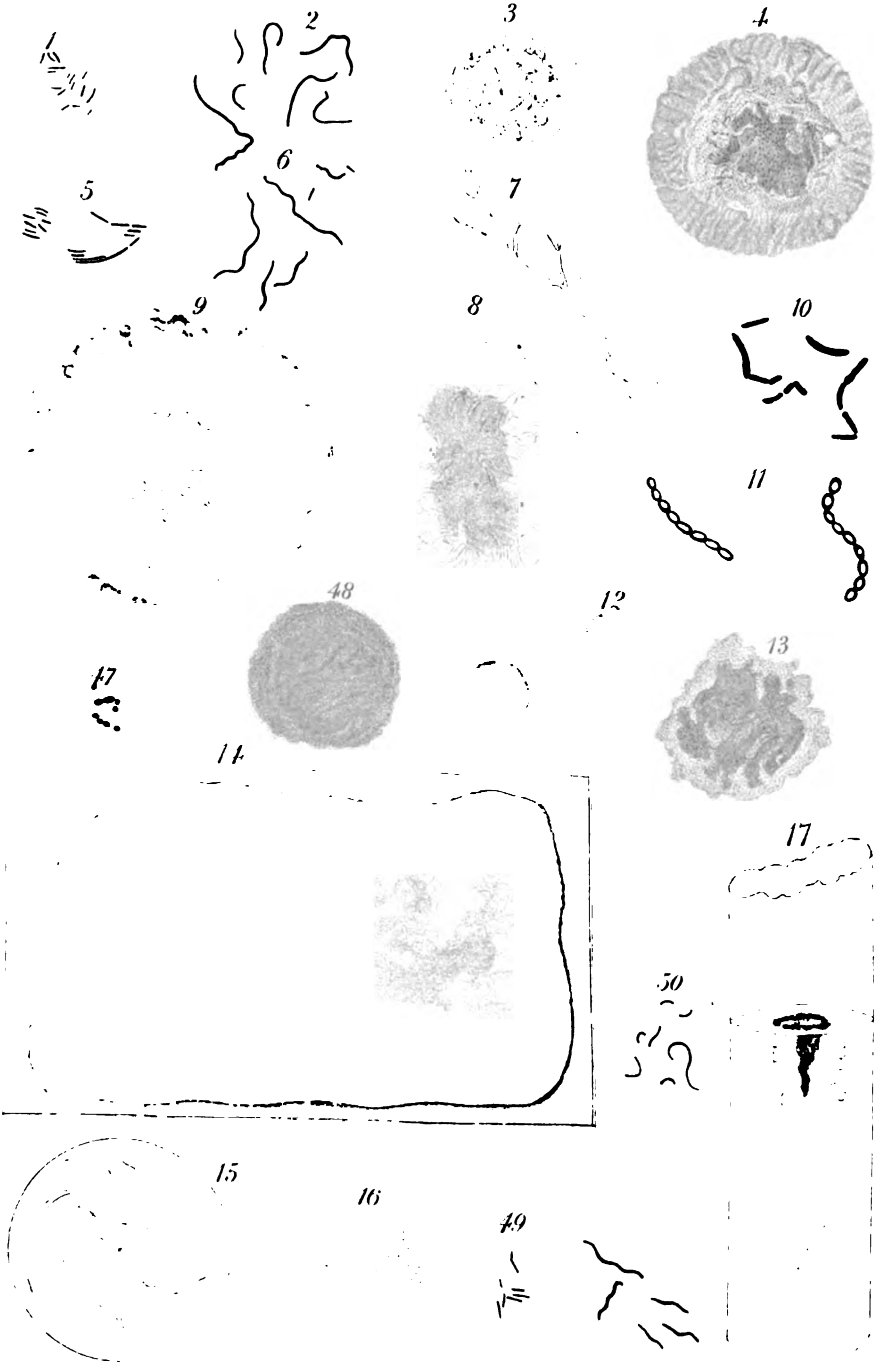
Caries of the teeth has been investigated—together with the bacteria found in the process—by Galippe and Vignal,[8 Mar.20] who made some interesting observations.

The *umbilical cord* has been taken up by Cholmogoroff,[398 B.14.H.1] who has found the following facts in regard to the bacteria present in it: The umbilical cord is, at birth, entirely free from all bacteria; all that may be found later come from outside sources. The non-pathogenic organisms developing on the stump are the sarcina lutea and the bacillus subtilis; the pathogenic are the staphylococcus pyogenes albus, aureus, and citreus, and streptococcus pyogenes. The stump either mortifies or mummifies; if the first, the pathogenic bacteria develop more easily; if the latter, less so. Gypsum-powder was found to be the best protective against bacteria and the best protective for the stump.

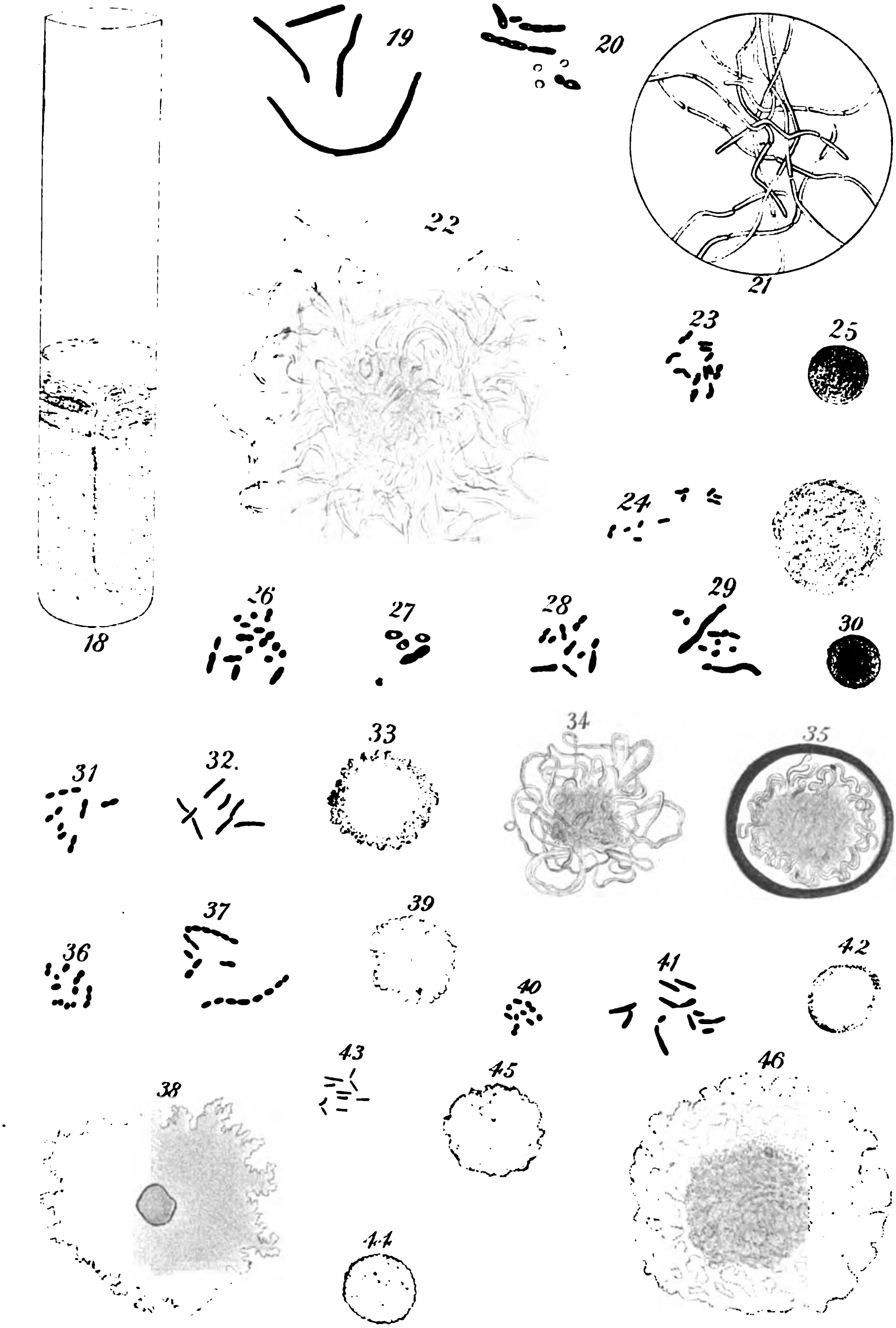
Vaccination.—Voitoff's claim[73 Apr.27] is stated that vaccination is the result of a *mixed* infection. His idea is that, finding always the same bacteria in the pustules, inoculation with pure cultures of these, singly, failed to produce any effects, but that, by injecting a mixture of cultures of the more common of them, he was able to produce a true vaccine-vesicle, together with protection against inoculation with true vaccine.

Water and Earth.—The typical bacteria occurring in these two materials have been well described by Grace C. Frankland.[58 July 3] There are included the more common forms occurring in her investigations upon water and earth, and they are all described so that they may be again identified. Of the forms in water there are given detailed descriptions of b. arborescens, b. aquatilis, b. liquidus, b. vermicularis, b. nubilis, b. ramosus, b. aurantiacus, b. viscosus, b. violaceus. Of the forms in earth there are b. diffusus, b. candicans, and b. scissus. The subject is so important from the point of view of the hygienic worker that the excellent figures accompanying the text are reproduced here:—

1. }
2. } B. aquatilis, preparation from a gelatin culture. × 1000.
3. Deep colony of b. aquatilis. × 100.
4. Surface colony of b. aquatilis. × 100.
5. B. arborescens, preparation from gelatin culture. × 1000.
6. B. arborescens, preparation from a bouillon culture. × 1000.
7. Young colony of b. arborescens. × 100.
8. Old colony of b. arborescens. × 100.
9. Still older colony of b. arborescens. × 100.
10. B. vermicularis, preparation from a gelatin culture. × 1000.



Typical Micro-organisms of Water. Frankland.
Zeitschrift fur Hygiene.



Typical Micro-organisms of Water. (Frankland.)
Zeitschrift für Hygiene.

Burk & McFetridge, Lith. Phila.

11. Spores of b. vermicularis from potato culture. × 1000.
12. Young colony of b. vermicularis. × 100.
13. Surface colony of b. vermicularis.
14. Colony of b. nubilis from a gelatin plate after forty-eight hours.
15. Centre of an old colony of b. nubilis. × 100.
16. Colony of b. nubilis. × 100.
17. Needle culture of b. nubilis in gelatin.
18. Needle culture of b. ramosus in gelatin.
19. B. ramosus from a gelatin culture 2 days old. × 1000.
20. B. ramosus from a 14-day-old agar-agar culture. × 1000.
21. B. ramosus, culture from a hanging drop. × 1000.
22. Old colony of b. ramosus. × 100.
23. 24 } B. viscosus, from a gelatin culture. × 1000.
25. Young colony of b. viscosus. × 100.
26. B. aurantiacus, from a colony on a gelatin plate. × 100.
27. The same. × 1500.
28. B. aurantiacus, from a potato culture. × 1000.
29. B. aurantiacus, from an agar-agar culture. × 1000.
30. Young colony of b. aurantiacus. × 100.
31. B. violaceus, from a gelatin culture. × 1000.
32. B. violaceus, from an old agar-agar culture. × 1000.
33 Young colony of b. violaceus. × 100.
34. Colony of b. violaceus which has liquefied the gelatin. × 100.
35. Old colony of b. violaceus. × 100.
36. B. scissus, from a colony on a plate. × 100.
37. B. scissus from a culture in bouillon. × 100.
38. Surface colony of b. scissus. × 100.
39. Deep colony of b. scissus. × 100.
40. 41. } Different forms of b. candicans. × 1000.
42. Young colony of b. candicans.
43. B. Diffusus, from a gelatin culture. × 1000.
44. Young colony of b. diffusus. × 100.
45. Somewhat older colony of b. diffusus. × 100.
46. Old surface colony of b. diffusus.
47. Gelatin colony of b. liquidus. × 1000.
48. Surface culture of b. liquidus.
49. Bouillon culture of b. nubilis.
50. Potato culture of b. nubilis.

PHAGOCYTOSIS.

The theory of Metschnikoff, included under this head, has naturally been the subject of more or less controversy ever since it was first promulgated, and the past year has seen a continuation of the work done to prove or disprove it. There is a good summary of the work[50, B.3,H.8] for this year, and Osler[9, Apr.13] has given a very accurate and complete review of the case up to the time of the delivery of his lecture. In regard to the disease, insisted upon by Metschnikoff as proving his case, Osler says: "We see, then, very little evidence in the blood in malaria favoring the theory of phagocytosis,—certainly no such campaigning on the part of the leucocytes as might be expected from the presence, in such numbers, of foes so destructive to the red corpuscles. In the spleen, bone-marrow, and liver—the organs in which the dead or dying blood-disks are normally cremated (to use Weigert's expression)—we have, as might be expected, an activity proportioned to the increased amount of material to be consumed, but scarcely such heightened phagocytic action as would indicate an aggressive warfare on the part of the leucocytes. Into the interesting theory that to the action of phagocytes is due the immunity against certain diseases or against a second attack I cannot now enter: in the present state of our knowledge it would be premature. To conclude, while phagocytosis is a wide-spread and important physiological process throughout the animal kingdom, and while it undoubtedly plays a most important part in many pathological conditions, the question of an active destructive warfare waged by the body-cells against the micro-organisms of disease must still be considered an open one."

Upon the subject of immunity, so closely connected with that of phagocytosis,[142 Feb.15] there are various theories. That of Toussaint, that after one attack of a disease (anthrax) the lymphatic ganglia undergo a hardening of their surrounding envelope, which makes them impervious to the after-entrance of infectious agents by this, their usual portal. Buchner's theory is mentioned,—that, under the influence of a first attack, the organs by a change, probably inflammatory, become afterward unsuitable as a culture medium for the bacteria. Grawitz's theory is also spoken of,—that the cells of the body and bacteria take their nutrition from the same places, and that it is a true fight for existence between them; if the cells come out victorious they become habituated to the struggle with the bacteria and are more able to resist a second attack, and that this quality is transmitted to the succeeding generations of body-cells by heredity, all of which is pure supposition, of course. Lastly, the theory of Metschnikoff, in which he supposes that each cell of the body acts on its own account; that is to say, that the digestion of the nutrient materials occurs in the cell itself,—the so called "intra-cellular digestion." His theory he has supported by several very clever papers on the subject, but other observers have not been able to follow out the course of this struggle. Wyssokowitsch has never been able to see the process in cold-blooded animals; Emmerich maintains that the leucocytes cannot make away with the bacteria unless the latter are *dead*, thus making of the body-cells the "scavengers of the blood." The review from which these remarks are condensed concludes with very much the same remark as does Osler,—"nothing irrefutable and definite, perhaps, in any of these hypotheses, but they are, nevertheless, worthy of registering and of retaining, for they are all, in different degrees, efficacious means of progress."

Another exceedingly interesting review of the theories and mechanism of immunity is given by Boulay.$\frac{100}{\text{Jan.19}}$ The fact that there is such a thing has been known for years in the observations made that certain races of men, or certain species of animals, were not attacked by certain diseases, but it was reserved for the advances in bacteriology to indicate the mechanism by which this might occur. He speaks of the theories as being divided into two classes, —the chemical, or humoral, and the biological, or vital. After a review of the various suppositions advanced, and speaking of phagocytosis, he says: "It seems, then, that the cellular theory fails to explain all the facts, but its author never intended that it should. The insufficiency of each one of the preceding, taken by itself, gives a reason for attempting to reconcile the chemical and biological theories. According to Bouchard, at the time of the purely chemical alteration of the fluids, there is also an alteration of the function of nutrition, which assures the persistence of the new state created by the malady; the chemical modification is accompanied by a dynamic one. By this hypothesis one can inherit immunity as one inherits gout or any other disturbed nutrition. It explains for us all the race immunities; in a word, all the hereditary immunities properly so called. In a study on anthrax vaccination, Gamaleia reaches conclusions which are not, in all points, in accord with the phagocytic theory. To him, anthrax vaccination is the result of the life of the vaccine in the body of the animal. This sort of "culture" has the effect of accustoming the body to the toxic products due to the growth of the infectious agents; accustomed to the poison, the cells are no longer paralyzed by their action, and behave in the presence of the pathogenic bacteria as if in the presence of any harmless organism or foreign body. If the part of the phagocytes is of importance, their action is at least subordinate to the chemical changes which have occurred in the body. The vaccines can be prepared out of the body, and the refractory state, perhaps, produced without any cellular struggle. This certainly is an attempt to reconcile the results of vaccination with bacteria with the existence of a chemical vaccination, the biological theories with the chemical ones.

Charrin$^{3}_{\text{May}}$, speaks also of immunity after a local lesion. After mentioning the remarkable differences seen in the inoculation of different species of animals with the same virus, and instancing the profound effects of the anthrax bacillus in animals and its comparatively slight effects in man, and of the bacillus of green pus in rabbits and guinea-pigs, he goes on to say that the lesions, although local, are nevertheless followed by profound changes in the organism at large. For, after one inoculation, which has healed and left only a local cicatrix, and made only an apparently local change at first, if the attempt be made to produce the same change again with the same organism, the result is either very slight or none at all; in other words, the malady was only local in appearance in the first place, for it produced so profound an alteration in the whole organism that it resists a second attack of the bacterium; and this resistance may be of varying degrees according to the amount used, so that immunity itself may be of varying degrees of completeness.

GENERAL.

Rodet$^{92}_{\text{Mar.}}$ has given a complete review of the various methods for obtaining a protection against the activity of bacteria by preventive inoculation. The paper is an exceedingly valuable one, but extends over several numbers, and is too long to be more than referred to here.

Peter,$^{142}_{\text{Jan. 30}}$ in the beginning of his course of lectures in Paris, gave one to which he says may be given the title of "The Rise and Fall of the Microbe." In it he concludes that because there are new methods accepted, and because the alkaloids of animal origin are acknowledged to have an activity in producing disease, therefore the foolishness of the assertions of the bacteriologists is demonstrated, and there is nothing but silence or an acknowledgment of defeat for the supporters of the pathogenic powers of bacteria. He concludes the lecture by saying that this is to be the fate of bacteriology, as of other theories: "From Broussais there remains to us irritation, from the numerical method a greater precision, from Claude Bernard the reflex actions, and from bacteriology a more rigorous hygiene." The lecture is quoted as showing the extreme views taken by the opponents of the theories advanced of late to account for the pathological changes occurring in disease, and not because it will be likely to carry dismay to the minds of the workers in this new branch of science.

Bacterio-therapy is treated by Cadogan-Masterman$^{26}_{\text{July}}$ in the way of a summary of all the clinical work done in this direction. After speaking of the methods employed by various clinicians to combat one bacterial disease by the use of cultures from the same or another, he gives these as the conclusions to be drawn from the work done: 1. The basis of the science of bacterio-therapy is an antagonism which exists between certain, if not all, bacteria. 2. That a nutritive medium which has been lived in by one form is inimical to the life of another, or even of the same, organism. 3. The new science assumes two forms, (*a*) bacterio-prophylaxis, (*b*) bacterio-therapy. The first is the best-known form, and already largely and successfully employed. The second, demonstrated in animals experimentally, still awaits clinical sanction for its use in man. 4. Experiments on the question of prophylaxis, conferred by substances generated by the vital energy of micro-organisms in media in which they have lived, give the key to what may be, in certain cases, the mechanism of bacterio-therapy, and may foreshadow what it is destined to effect in the future. The problem is exceedingly difficult, because we see that the minutest physico-chemical changes alter the course and the result of the struggle for existence on the bacterial battle-field.

Leucomaines.—The presence of these alkaloids in normal blood has been demonstrated by Wurg.$^{61}_{\text{Apr.27}}$ He claims that normal ox-blood contains, besides the bases already known for a long time, a certain number of alkaloids,—leucomaines,—fixed or volatile, and in a proportion not exceeding 3 grammes (45 grains) to 100 litres (22 gallons). Most of them were in too small quantities for analysis, and only two of them were studied,—a volatile one, "methylamine," and a new one to which the name "plasmaine" has been given. The presence of these alkaloids in normal blood is especially interesting because of their connection with the elimination of nitrogen.

Bouchard[1, Mar. 12] gives the first clear statement of a new theory of *inoculation* against disease. He says that there ought to be a careful separation of the soluble matters secreted by the micro-organisms from the toxic matters which exist in connection with them. The former only are suitable for inoculation; he even thinks that they might come into use as medications to arrest the progress of a disease which had already begun, rather than for preventive inoculation. Thus it might be that the substances that arrest the development of micro-organisms in cultures might also be used to combat their growth in the body, and in this way put an end to the disease which the bacteria had caused.

Brieger[20, Mar.] gives a list of all the *ptomaines* and *toxines* thus far isolated, making a list of forty-one, which is very valuable for reference.

Hesse,[58, Jan. 31] made an investigation upon the favorable or unfavorable nature of the more common articles of *food* as nutrient media for the typhoid and cholera organisms, and found that, in general, the ordinary articles of food furnished a more or less favorable ground for the development of these bacteria.

The *ptomaine of milk* is treated by Delfin,[459, July] and his conclusions are (1) that milk may, during its fermentation, give rise to a large number of alkaloids which are possessed of very toxic properties, and (2) that milk and, in fact, all albuminoid substances may undergo such changes by digestion that they may produce the same effects as if a pathogenic bacterium had been injected, and that the use of metallic vessels hastens this process.

The *germicidal action of blood* is illustrated by experiments by Buchner[50, B.5, p.816] and Nuttal,[208, Nov. 3] which show that both defibrinated and freshly-drawn blood have a decided deadly action upon bacteria for as much as four hours after it has been drawn from the body, and that this action is especially marked toward the pathogenic bacteria. For example, the number of anthrax bacilli was reduced in two hours, in certain material, from 4800 to 56, by being mixed in a test-tube with defibrinated blood, and three hours later only three living bacteria remained. As remarkable an action was shown against other pathogenic bacteria, but the destruction of the putrefactive organisms was much less marked, and against some of them the blood seems to have very little influence.

EPIDEMIOLOGY.

BY JOHN B. HAMILTON, M.D., LL.D.

MANY parts of the globe have had serious epidemics during the past year. The United States has escaped a general epidemic, with the exception of the influenza, which has assumed a marked epidemic type. The first reports of this malady were received from Russia, where it appeared about the latter part of November, 1889. Six weeks after its inception it had overrun the greater part of Europe, being specially severe in Vienna and Paris, and shortly after it reached America and spread with great rapidity. The disease at first presented itself in a mild form, the mortality being due principally to the complications of bronchitis and pneumonia which frequently accompany or follow it. When uncomplicated the disease was recovered from in about ten days, but when accompanied by marked nervous depression or pulmonary complications it has been attended with high mortality. The disease was at its height at the close of the year.

Yellow Fever.—The mild winter following the Florida yellow-fever epidemic of 1888 gave rise, in some quarters, to fears of another outbreak during the summer of 1889. But the anticipated danger was not realized, and, with the exception of a few cases imported from other countries and detained at our quarantine stations, no case of yellow fever has appeared on the mainland of our coast. Two cases occurred in the island of Key West. We are justified in claiming that this result is mainly due to the effective sanitary measures enforced during and after the Jacksonville epidemic, and to the general efficiency of our quarantine service. The Legislature of Florida[1025 Mar. 29] passed a bill creating a State Board of Health, which was approved February 20, 1889. Other countries have been less fortunate than ourselves in their struggle against yellow fever, and the disease has been specially virulent in the cities of Rio de Janeiro, Santos, and Campinas, in Brazil. In Cuba, Hayti, and other West Indian and Central American ports it has run its accustomed course.

Paul Gibier, of Paris,[9, Jan. 26] read a preliminary paper on the yellow fever epidemic in Florida before the New York Academy of Medicine, January 17th. He expressed the opinion that many cases, reported as such, were not due to yellow fever, but to bilious remittent or pernicious fever. He does not consider the presence of albumen in the urine as a certain diagnostic point, and the invariable presence of a specific microbe is denied. With regard to treatment, he says that "yellow fever is an intestinal infection, which must be treated from the very beginning with evacuants and disinfectants of the intestines, as bichloride of mercury, naphthalin, and tannic acid."

Ferreira[111, Aug.] gives some interesting notes on the recent yellow-fever epidemic at Campinas. The disease was imported from Santos, and at first attacked only strangers, or those unacclimated, but later on the natives themselves fell victims to it. Like most other inland towns, the sanitary condition of Campinas is deplorable, and the resulting contamination of drinking-water by fæcal matter is ascribed as a cause for the unusual virulence of the epidemic.

Amadeo, of Porto Rico,[15, Feb.] alluding to the subject of yellow fever on that island, says, in answer to the question, "What, then, is yellow fever?" that, according to his observations in Porto Rico, it is nothing more than the passing of the pseudo-continued climatic fever of the island into what we may term a tropical typhus, and does not believe a micro-organism to be the special, immediate, and specific cause of the fever.

The annual report of the Supervising Surgeon-General of the Marine Hospital Service contains articles on the diagnosis, by John Guitéras; treatment and natural history of yellow fever, by Faget; and also an account of the management of the detention camp at Camp Perry during the late epidemic. It gives a complete history of this disease as it appeared in Florida in 1888–9. One of the most interesting features of the report is the contribution of George M. Sternberg, of the army, giving the results of his investigation on the claims of Freire, of Brazil, and Carmona y Valle, of Mexico, to have discovered the yellow-fever germ. A *résumé* of these investigations was published in last year's ANNUAL, Section H, vol. i.

Cholera.—Cholera was declared epidemic in Mesopotamia on the 27th of July, 1889. A few cases had occurred as early as

July 10th at Bassora. The United States Consul-General at Constantinople reported[1025 Sept. 30] the existence of cholera at Bassora, Bagdad, Shatia, Nasriyeh, Sukh-es Sheyuk, and Remodych. The epidemic spread rapidly along the course of the rivers Euphrates and Tigris, and, passing the limits of Mesopotamia, extended into Arabia, Persia, and Asiatic Turkey. Advices received[1025] up to December 27, 1889, reported the epidemic as having invaded the important city of Mossoul, while in other parts of the infected district, and especially the region to the south, the situation had greatly improved.

Unofficial advices[1025 May 24] state that the epidemic of cholera at Zamboanga, Philippine Islands, has come to an end. Some suspicious cases were at the same time reported from Manila. The United States Consul, in a dispatch dated June 3, 1889, officially reported the epidemic prevalence of cholera at Manila.

A critical review[15 May] of the report of S. L. Pisani, on the "Cholera in Malta in 1887," agrees, like all English insular anti-quarantinists, with Pisani in his opinions that quarantine restrictions are useless to prevent the introduction of cholera, and that the only safeguard is in the improvement of the hygienic condition of the people and their habitations. The germ of the disease, he says, cannot be excluded. Our object, therefore, should be to prepare a soil in which it cannot thrive. After this declaration it is surprising to find that the report concludes with the advice that, until *all* the sanitary measures which he advocates are adopted, "the island will be forced to adopt restrictive measures as the only means, however imperfect, of preventing the importation of the cholera germ."

Mordtmann[232 Sept. 30] comments on the rapid spread of the epidemic of cholera which broke out in Mesopotamia, July 27th, the whole of which country was overrun during the month of September. The total number of deaths up to September 30th is given as 6414, but he considers this far from the actual number. The difficulty of establishing proper quarantine and sanitary regulation is much deplored.

Typhus Fever.—A correspondent[2 June 15] writes from Egypt that the epidemic of typhus fever, which threatened to commit such ravages in the country, has happily almost entirely yielded to the energetic measures which were adopted at the Barrage and in the villages to which the disease had spread. Spacing out the population, and cleansing, whitewashing, and ventilation of such houses as were allowed to stand seem to have acted like a charm.

Diphtheria.—H. Barbier[55, Jan. 26] supports the doctrine that diphtheria may be transmitted from the lower animals to man. It is a known fact that fowls suffer from a disease of the throat, characterized by the formation of a false membrane; and he considers this as an important etiological factor in the transmission of the disease. He also believes that the excreta of these animals may have some influence in its propagation.

Similar views are expressed in a report of the Medical Officer of the Local Government Board[15, June] on the "Geographical Distribution of Diphtheria in England and Wales." The report embodies the result of a lengthened study of facts relating to diphtheria for the twenty-six years ending with 1880: "The practical deduction suggested by these facts is that the cause or causes of diphtheria should not be sought for primarily in any high development of civilization, such as sewers, but rather in some condition associated with a more primitive mode of life. The line of investigation, however, which seems to me most promising lies in comparative pathology. The peasantry live on terms of great intimacy with domestic animals, more particularly cows, sheep, pigs, and poultry (including pigeons). Some little-known disease of some one or other of these creatures may be capable of inducing, in men or women brought into frequent and close contact with them, a trivial 'membranous sore throat;' then, under suitable conditions of the recipient and of environment, the more generally recognized form of the disease, 'true diphtheria,' or, as it used to be called, 'cynanche maligna,' may result."

Attention is called[6, Oct. 19] to the serious increase of fatal diphtheria in the large towns of England and Wales, but especially in London. The fact having been brought to the notice of the Local Government Board, authority was granted to the Metropolitan Asylums Board to receive cases of this disease for isolation and treatment in their hospitals. It is of interest to note that, coincidently with this increase in the recorded mortality from diphtheria, there has been a remarkable decline in the mortality from scarlet fever. This has been specially marked in London. Thus, while the death-rate from scarlet fever, during 1888, in London was 29 per cent. below the mean rate in the ten preceding years, the rate from diphtheria exceeded the same average by 23 per cent.

Bruhl and Johr,[6 Sept. 28] of the Imperial Health Institute, of Berlin, give an interesting review of the elaborate statistical survey of the prevalence of diphtheria and croup in Prussia during the eight years 1875 to 1882. While not denying the specific origin of the disease, they claim to have proved that the increase in mortality is closely allied with prevalent atmospheric conditions, the maximum mortality being in those parts of the kingdom where there is, throughout the year, less equability of temperature and humidity of the air. Where these two conditions are more equable, or where the air is warm and dry, the mortality is lowest.

The Kentucky State Board of Health[1097 Oct. 17] calls the attention of health officers and people in general to the unusual prevalence of diphtheria in many parts of the State. The methods recommended for preventing the occurrence or restricting the spread of the disease are in accord with the dictates of the highest sanitary science. The Board of Health of New Haven has likewise issued minute instructions for the prevention of the spread of scarlet fever and diphtheria.

Scarlet Fever.—Scarlet fever has appeared in an epidemic form in many English towns during the past year, especially in London, Birmingham, Plymouth, Camden Town. Generally, the death-rate has been low.

Klein[15 July] notes the following points as aids in making the diagnosis between the Hendon and the Wiltshire disease of milch-cows: The Hendon disease is, more commonly than the Wiltshire disease, characterized by the loss or loosening of hair in patches. The teat-sores in the Wiltshire disease appear much more flat and superficial than those seen at Hendon. The teat-scabs of the Wiltshire disease, more commonly than those of the Hendon disease, are found adherent to the base of the sore during three or four weeks. The Wiltshire disease is much more readily transmitted to man in the operations of milking than is the Hendon disease. Indeed, I myself know of no instance where the Hendon disease (that which produced scarlatina in human consumers of of milk) has been transmitted by inoculation to the human subject.

Measles.—The influence of the closure of schools in an epidemic of measles is admirably shown by Wolford,[407 May] health officer of Cardiff, in a report upon the epidemic which occurred in the autumn of 1888 among the children attending school in that city. Every effort to stamp out the epidemic was unavailing until the schools were closed for a period of four weeks. The number of cases at once diminished, and only 4 cases appeared among 20,000 scholars after the schools were reopened.

Dengue.—Dengue appeared in Asiatic Turkey, in an epidemic form, at the beginning of August. It ravaged Smyrna, Magnesia, and other towns in Asia Minor, and reached the Dardanelles about the end of September. It was also reported, on November 29, 1889, as prevailing in Jerusalem. The controversy now existing as to the alleged identity of the recent epidemic and dengue cannot be settled at this time, further data and more extended observation being required.

Typhoid Fever.—The Michigan State Board of Health has declared typhoid fever as coming under the law requiring physicians to report all such cases to the health officers, under penalty of a fine for non-compliance.

Tuberculosis.—An editorial $^{1}_{\text{Mar. 2}}$ says: "The question as to whether tuberculosis can be contracted by the use of the flesh or products of tuberculous animals cannot be regarded as being definitely settled, but enough collateral facts have been observed to render the transmissibility of the disease probable rather than possible. Fowls have become infected by the sputa of tubercular patients, and hogs by the milk of cows in which there was tubercular disease of the udder or teats. The transmission of pulmonary tuberculosis in man from one individual to another is undoubted, and, unless the *bacillus tuberculosis* is greatly modified in its passage through the lower animals, the danger of the infection traveling from animals to man would seem to be very great. The sanitary conditions and surroundings of cow-stables should be improved, the use of grains, swill, etc., prohibited, and a pure water-supply insisted upon. All tuberculous animals should be killed and all portions of them destroyed, preferably by fire. These latter measures have resulted in preventing the spread of pleuro-pneumonia, a highly contagious disease, and will probably at no distant day suppress it entirely. Local legislation would probably be of little use, as the laws, if they could be enacted in the different States, would vary so greatly as to prevent any active co-operation.

The Federal Government should take hold of this matter, as was done in the case of pleuro-pneumonia."

Leprosy.—A paper read by P. S. Abraham$^{6}_{\text{June 22}}$on leprosy, before the Epidemiological Society of London, makes special mention of the rapid spread of that disease during the last few years, and holds that there is increasing evidence respecting its contagiousness.

Small-pox.—The small-pox epidemic which prevailed in Catania and other Italian cities, during 1887 and 1888, has continued during the past year. The United States Consul at Catania gives the following information concerning the epidemic at that point: 1. The mortality was at the rate of 15 per cent. 2. No person having previously been successfully vaccinated contracted the disease within a period of six years from that vaccination. 3. Out of a population of 177,165 only 12,579 were revaccinated. 4. The mortality in the regular hospitals only reached 4 per cent. About 6000 persons were attacked by the disease, of whom 926 died.

The disease has been epidemic in Warsaw, Russia; also in Calcutta, India, and in the Mauritius Islands. It has been prevalent in Brazil, especially in the following cities: Rio de Janeiro, Macayo, Maceio, and Bahia. In the United States isolated cases have occurred in many of the large cities. Slight outbreaks have occurred in Denver, Colorado, and Little Rock, Arkansas.

Vaccination.—The subject of vaccination is being again agitated in England, and a Royal Commission has been appointed to investigate the working of the Vaccination Acts. An editorial$^{6}_{\text{Nov. 2}}$ reviews a partial report made by the commission, which, however, treats only of the historical and statistical case in favor of vaccination. H. Barbier$^{55}_{\text{Aug. 31 to Sept. 14}}$gives a very interesting study of the respective merits of human and animal vaccine, and concludes with the opinion that the latter is the better as a prophylactic against small-pox, and by far the safer of the two.

C. Marocco$^{762}_{\text{Jan.}}$reports a case of diffuse tuberculosis in an infant, 5 months old, caused by the inoculation of cow-pox. He declares that some steps should be taken to avoid such accidents, and proposes that, after having obtained the vaccine matter, the animal should be killed and carefully examined by a veterinary surgeon to determine its soundness. All vaccine matter from diseased animals must be immediately destroyed.

Woytkoff, of Moscow,$^{35}_{\text{Apr. 11}}$announces that he has succeeded in preparing an artificial vaccinating lymph, with which he has reproduced all the characterizing symptoms of natural vaccination.

DISINFECTANTS.

Dujardin-Beaumetz,[80 Jan.] in a lecture delivered at the Cochin Hospital, Paris, concludes as follows, after a lengthy discussion of the subject of disinfectants: "I have finished this long enumeration of disinfectants, and, if I were to sum up, I would say that the one disinfectant above all is moist heat when it attains the temperature of 110° to 115° C. (230° to 239° F.), but, as this degree of heat is not applicable to all the circumstances where disinfection is demanded, we must also employ the liquid and gaseous disinfectants. At the head of the first we must place corrosive sublimate, which is without an equal, then sulphate of copper. Among the gaseous disinfectants, you must give the first place to sulphurous acid and chlorine."

The following are the conclusions arrived at from a series of experiments made by Dubief and Brühl, under the direction of Dujardin-Beaumetz,[80 Feb.] with the object of determining the efficacy of sulphurous-acid gas as a germicide: 1. Sulphurous-acid gas acts as a germicide on micro-organisms contained in the air. 2. This action is strongest when moisture is present. 3. It acts also upon the spores of the bacteria. 4. In its pure state it will, after prolonged action, destroy even dried spores.

Cyrus Edson,[50 Nov. 16] in a paper read before the American Public Health Association, October 24th, on the subject of the disinfection of dwellings by means of sulphur dioxide, concludes as follows: "It would seem that the proper and most practical method of disinfection of dwellings, after the occurrence in them of exanthemata and of diphtheria, is by means of sulphur dioxide, and that all clothing, bedding, etc., used in direct contact with the patient, should be removed to a disinfecting station, properly equipped, and there subjected to heat of sufficient intensity to destroy all contagious matter. This in future will, I believe, be the method pursued by the Health Department of the City of New York."

Reynolds[16 Aug.] introduced a new disinfecting agent to the Royal Dublin Society on June 22d. The agent is called "thiocamph." The basis of this novel disinfectant is a liquid which results when sulphur-dioxide gas is brought in contact with camphor.

STATE MEDICINE.

The Infectious Disease Notification Act[6, Oct. 26] went into effect in London, October 30, 1889, and will go into operation in other urban and rural districts as soon as accepted by each local sanitary authority. The adoption of this act will involve upon every medical practitioner attending on a case suffering from any of the infectious diseases mentioned in this act to report such case to the medical officer of health. The diseases to which the act applies include small-pox, cholera, diphtheria, membranous croup, erysipelas, scarlet fever, typhus, typhoid, relapsing, continued, and puerperal fevers.

A. Campbell Munro,[6, June 29] Medical Officer of Health for South Shields and Jarrow, gives an interesting table showing the effects of compulsory notification of infectious diseases upon the death-rate. This table shows the death-rate from 1871 to 1878 and from 1879 to 1888, during which latter period compulsory notification was in force:—

BOROUGH OF JARROW: MEAN DEATH-RATES FOR THE YEARS 1871 TO 1878 AND 1879 TO 1888.

PERIODS.	From All Causes.	From the Seven Principal Zymotic Diseases.*	From Small-pox.*	From Measles.*	From Scarlet Fever.*	From Diphtheria.*	From Whooping-cough.*	From "Fever."*	From Diarrhœa.*
1871 to 1878 . . .	25.193	69 04	15 31	2 00	17.87	0.87	7.68	7.81	17.50
1879 to 1888 . . .	20.810	37.49	0.36	8.83	6.72	1.45	7.27	2.65	10.21

* These rates are stated, for greater clearness, per 10,000 of the population.

J. B. Hamilton contributed an article[61, Aug. 24] on "International Comity and State Medicine" to the section of State Medicine at the annual meeting of the American Medical Association, June 25th. The following resolution, adopted by the quarantine convention held at Montgomery, Ala., in March, 1889, was taken as a text:—

"*Resolved*, That this conference is of opinion that it is a duty devolving on all nations to take measures to eradicate any plague centre from their territory, and that the existence of such plague centres is a menace to all other nations, and that our State Department be requested to take measures through proper diplomatic channels for the conveyance of this opinion to the governments deemed obnoxious to the opinion as herein expressed."

The following statement was made in the paper: "One of the *absolute* rights of independent States, resting upon general consent and common usage, and acknowledged as the most important, is the right of self-preservation. It follows, logically, that preservation from epidemic falls within the rule, and a nation should have a right to view, as equal acts of hostility, the sending out of a piratical craft or of a ship infected with yellow fever, cholera, or other contagious disease." By a *viva voce* vote the Montgomery resolutions were adopted by the Association.

The subject of quarantine appliances receives due attention in the report of the Bureau. New and improved disinfection machinery has been adopted for the quarantine stations, by which dry or moist heat may be applied at pleasure. The "jacket" chamber is believed to be at once the most simple in construction and the most efficient.

The construction of movable disinfecting machinery, as recommended by C. P. Wilkinson, of Louisiana, is highly recommended. The late epidemic developed the fact that neither the Government nor the States were prepared on short notice to disinfect the fomites in an infected village by moist heat. The sulphur process always causes more or less damage to the goods subjected to it, and some such machine as has been designed for the wharves, to be placed on car-trucks, with axles at standard gauge, would be of great service in any place where rapid steam disinfection was needed. This machine could, when constructed, be sent anywhere on any ordinary railroad line. The supervising architect has embodied the idea in a plan, the dimensions of which precludes presentation here, and which, reduced, would be unintelligible. The reader must therefore be referred to the original report.

A "Report on the Sanitation of Ships and Quarantine" has also been made by J. B. Hamilton to the Hon. J. G. Blaine, Secretary of State, for the use of the International American Congress, now in session at this Capital. The importance of international action in this matter is stated, and, as well, the necessity for each nation destroying centres of infection within its boundaries, the establishment of international quarantine stations, and the adoption of an international sanitary union. The draft of a convention embodying these principles was submitted for the consideration of Congress.

INDEX TO VOLUME FOURTH.

By C. SUMNER WITHERSTINE, M.S., M.D.,

PHILADELPHIA.

Absinthism.........I- 6
Acetonuria.........K- 35
Acne.........A- 3
  disseminata, therapeutics.........A- 3
  necrotica.........A- 3
  small papular scrofuloderm.........A- 3
  treatment.........A- 51
Acoustics.........C- 39
  auditory sensations, localization..C- 41
  color-hearing — *L'Audition Colorée*.........C- 41
  deafness, hereditary.........C- 39
  hypnotism.........C- 41
  report of Royal Commission on Deaf, Dumb, and Blind.........C- 42
  teeth and ears, relation between diseases of.........C- 40
  telephone, injurious effect upon hearing.........C- 39
Albuminuria—etiology.........K- 9
Alcoholic inebriety.........I- 1
  pathology.........I- 3
  relation to crime.........I- 5
  responsibility in.........I- 6
  statistics.........I- 6
Alopecia.........A- 29
  areata.........A- 29
Anosmia.........D- 20
Anthrarobin, in skin diseases.........A- 50
Antrum, diseases.........D- 32
  empyema.........D- 32
  syphilis.........D- 34
  tumors.........D- 34
Arsenic, poisoning by.........J- 18
Atropine, poisoning by.........J- 19
Auditory sensations, localization.........C- 41

Bacillus—aphidæ.........L- 26
  capsulatus.........L- 8
  carcinomata.........L- 10
  cholera.........L- 7
  coffee, non-germicide.........L- 11
  corn-stalk disease.........L- 9
  diphtheria.........L- 12
  enteridis.........L- 6
  erysipelas.........L- 12
  fever.........L- 13
  gonococcus.........L- 13
  green sputum.........L- 13
  gregarineen.........L- 13
  hominecrobiophilus.........L- 6
  hernia.........L- 17
  maidis.........L- 20
  malaria.........L- 19
  mesentericus vulgatus.........L- 21
  milk and blue milk, carriers.........L- 21
  moor-fowl disease.........L- 20
  motility.........L- 20
  murisepticus pleomorphus.........L- 29
  musk.........L- 21
  phosphorescent.........L- 22
  pleomorphism.........L- 22
  pneumo-bacillus, Fränkel.........L- 22
  pneumo-bacillus, Friedländer.........L- 22
  pneumo-bacillus, staining.........L- 22
  pneumo-enteritis, of pigs.........L- 23
  pseudo-tuberculosis, of rodents..L- 26
  puerperal fever.........L- 21
  rabies.........L- 26
  rauschbrand.........L- 26
  red milk.........L- 20
  scarlet fever.........L- 27
  Scheibenzuber's.........L- 6
  spiro-bacillus, Cienkowski.........L- 22
  syphilis.........L- 29
  tetanus.........L- 30
  tuberculosis.........L- 30
  typhoid.........L- 33
Bacteria—bacterium rosaceum metalloides.........L- 27
Bacteria, caries of teeth.........L- 34
  cereals.........L- 11
  earth.........L- 12
  germicides and antiseptics.........L- 16
  hypothetical treatment by.........L- 17
  ice, relations.........L- 18
  kephir.........L- 18
  lung surface.........L- 18
  mussel.........L- 21
  oxidation.........L- 21
  putrefying meat.........L- 26
  saccharomyces kephir.........L- 18
  saccharomyces lactis.........L- 29
  salting meat, effect.........L- 27
  septic, new forms.........L- 29
  spores and granules in.........L- 28
  stomach.........L- 28
  umbilical cord.........L- 34
  vaccine-vesicle.........L- 34
  water and earth.........L- 34
Bacteriology.........L- 1
  methods.........L- 1
    coloring bacteria.........L- 1
    culture media.........L- 3
    cultures, preservation.........L- 2
    manipulating chamber.........L- 1
    milk, culture media.........L- 3
    museum, formation.........L- 1
    photo-micrography, uses.........L- 3
    plate cultures, illustrations.........L- 1
    stain for cilia and flagellæ.........L- 4
    syringes, new.........L- 3
    touraillon, culture medium.........L- 6
Bacterio-therapy.........L- 39
Bacteriuria.........K- 55
Blood, germicidal action of.........L- 40
  leucomaines in.........L- 30
Bunions, treatment.........A- 53
Burns and scalds, treatment...A-49, 50, 57

Carbonic oxide, poisoning by.........J- 19
Cardiac injuries, fatality.........J- 4
Carica papaya, in tattoo-marks.........A- 54
Cerebral abscess, from suppurative otitis.........C- 31
Chilblains.........A- 56
Chloral, poisoning by.........J- 21
Cholera, Asiatica, epidemics of.........M- 2
Choluria.........K- 35
Chyluria.........K- 36
Cocaine habit.........I- 10
  symptomatology and toxicology..I- 10
  treatment.........I- 11
Cocaine poisoning, in nasal treatment.D- 38
Color-hearing—*L'Audition Colorée*..C- 41
Cornu cutaneum.........A- 15
Cylindroma of skin.........A- 43
Cystinuria.........K- 37

Deafness, from otitis media.........C-15, 17
  from parotitis, total.........C- 27
  from scarlatina.........C- 27
  hereditary.........C- 39
  hysterical.........C- 41
Death by drowning.........J- 15
  by hanging.........J- 16
Dengue, epidemics of.........M- 6
Dermatitis (burns and scalds)..A-49, 50, 57
  gangrenosa infantum.........A- 47
  herpetiformis, treatment.........A- 6
Diabetes insipidus (see Polyuria).........K- 1
Diphtheria, epidemics of.........M- 4
Disinfectants.........M- 8
  moist heat.........M- 8
  sulphurous-acid gas.........M- 8
  thiocamph.........M- 8

Ear, external.........C- 1
  external auditory canal, hyperostosis.........C- 1
Ear, external, foreign bodies.........C- 5
  furuncles.........C- 4
  neuroses.........C- 3
  otitis externa.........C- 3
Ear, internal.........C- 27
  acoustic nerve, electrolysis of.........C- 28
  deafness following mumps, total.C- 27
  inflammation of labyrinth following scarlatina.........C- 27
Ear, middle.........C- 10
  attic, reduplications of membrane.........C- 26
  myringitis, pure.........C- 14
  non-purulent disease.........C- 24
    Delstanche's air-pump.........C- 25
    Lucae's double-bag.........C- 25
    Lucae's pressure-sound.........C- 26
  otitis media, acute — functional nervous disturbances.........C- 14
      micro-organisms.........C- 10
      treatment.........C- 15
    chronic—otorrhœa.........C- 15
      deafness from.........C-15, 17
      electricity in.........C- 21
      excision of malleus.........C- 18
      excision of membrane and malleus.........C- 17
      Loewe's new dressing.........C- 16
      loosening of stapes.........C- 22
      round window, perforation..C- 26
      Schrapnell's membrane, perforation.........C- 20
      treatment, general.........C- 23
      tympanic granulations.........C- 20
  polypi—cerebral symptoms.........C- 21
Eczema, chronic.........A- 50
  seborrhœicum.........A- 50
Elephantiasis.........A- 9
  nævoid.........A- 12
Epidemiology.........M- 1
Epistaxis.........D- 18
Erythema, blenorrhagic.........A- 1
  multiforme.........A- 2
  with icterus.........A- 1
Exophthalmic goitre.........H- 6
  etiology.........H- 6
  pathology.........H- 6
  symptomatology and complications.........H- 7
  treatment.........H- 7
Eye — anomalies, embryology, and histological anatomy.........B- 1
  choroid, diseases.........B- 79
    chorio-retinitis.........B- 80
    choroiditis.........B- 80
    detachment.........B- 81
    ossification.........B- 80
    rupture.........B- 79
    tumors.........B- 80
      glandular.........B- 81
      sarcoma.........B- 80
  ciliary region, diseases.........B- 58
    sarcoma.........B- 58
    senile uvea.........B- 58
  conjunctiva, diseases.........B- 36
    argyria.........B- 36
    atrophy.........B- 38
    bulbar inflammation.........B- 36
    conjunctivitis, granular, and trachoma.........B- 42
      infectious.........B- 42
      simple.........B- 38
    cysticercus, subconjunctival.........B- 46
    dacryocystitis.........B- 42
    microscopic examinations in..B- 37
    necrosis.........B- 37
    œdema and congestion from ptomaines.........B- 36
    ophthalmia, gonorrhœal.........B- 41
      neonatorum.........B- 39

Eye, conjunctiva, purulent ophthalmia...B- 41
  pannus...B- 43
  pigment-spot, subconjunctival...B- 36
  pterygia...B- 45
  reflexes...B- 47
  symblepharon...B- 38
  tuberculosis, primary...B- 45
  tumors — adeno-chondro-lipoma...B- 46
    dermoid...B- 37
    epithelioma...B- 46
    leucosarcoma...B- 47
    lupus, primary...B- 46
    melanosarcoma...B- 47
  xerophthalmia...B- 38
 cornea, diseases...B- 47
  amyloid degeneration...B- 54
  discoloration...B- 48
  fibrine coagulation...B- 48
  keratalgia, traumatic,...B- 49
  keratitis, band-, binocular...B- 50
    bullosa...B- 49
    contagiosa...B- 50
    dendroides mycotica exulcerans...B- 52
    subepithelialis centralis...B- 51
  keratoplasty-transplantation...B- 52
  opacity, central congenital...B- 47
  silver images in inflamed...B- 48
  staphyloma...B-50, 52, 53
  traumatism, effect...B- 47
  tumors, dermoid...B- 54
  ulceration...B-52, 53
  wounds...B-49, 52, 53
  xerophthalmos...B- 54
 extra-ocular muscles, diseases...B- 31
  anomalies...B- 35
  asthenopia...B- 35
  cyst, serous or mucous...B- 35
  heterophoria...B-34, 35
  insufficiency...B-31, 35
  ophthalmoplegia...B- 35
  strabismus, convergent...B- 34
  strabismus, divergent...B- 31
 glaucoma...B- 90
 instruments...B-109
  capsule-hook, Bronner's...B- 75
  cataract-knife, Bettremieux's...B-110
  electro-magnet, Tiffany's...B-111
  extraction-fork, Hansell's...B-110
  fixation-mirror, Whitney's...B-109
  irrigator, Undine...B- 73
  operating-bench for children, Anderson's...B-110
  perimeter, portable, Schweigger's...B-109
  plaques, upper-lid operations, Landolt's...B-111
  record-blank, Allyn's...B-109
  spring-speculum, Walker's...B-110
  strabismometer, Weeks's...B-110
 iris, diseases of...B- 54
  heterochromia iridum...B- 55
  iridocylitis and iridochoroiditis...B- 56
  irido-dialysis...B- 55
  iritis, granulation, non-penetrating trauma...B- 56
    monocular suppurative...B- 55
    traumatic, penetrating hair...B- 54
  myosis, medicinal...B- 58
  oscillatio pupillæ...B- 58
  paralysis sphincter, intra-ocular hæmorrhage...B- 55
  rupture, traumatic...B- 54
  tumors—cysts...B- 56
    sarcoma...B- 57
 lachrymal apparatus, diseases...B- 30
  blennorrhœa...B- 30
  electrolysis of duct...B- 30
  epiphora...B- 30
  erysipelas and abscess of sac...B- 30
  foreign body in duct...B- 30
  tumors of gland—adenoma...B- 30
    adeno-sarcoma...B- 31
    sarcoma...B- 31
 lens, diseases...B- 59
  bleb formation...B- 60
  cataract — Bronner's capsule-hook...B- 75
    double congenital...B- 77
    extraction...B-62, 72, 75
    incipient senile...B- 60
    intra-ocular lavage...B- 73
    monocular...B- 61
    needling...B- 74
    pathology...B- 77
    post-operative hæmorrhage...B- 77
Eye, lens, diseases, post-operative panophthalmitis...B- 75
    post-operative treatment...B- 75
    secondary...B- 77
    suction...B- 74
    traumatic...B- 61, 72
    zonular...B- 61, 72
  composition...B- 59
  dislocation, spontaneous...B- 71
    traumatic...B- 62
 lids, diseases...B- 18
  blepharitis...B- 18
  blepharospasm...B- 21
  chalazia...B- 22
  ectropion and entropion...B- 19
  eyelashes, sudden graying...B- 22
  integument, restoration...B- 21
  phthiriasis...B- 18
  pigmentation...B- 18
  symblepharon...B- 21
  telangiectasis...B- 18
  trichiasis and distichiasis...B-19, 20
  tumors—epithelioma...B- 22
    horny growth...B- 22
    sarcoma...B- 23
    teratoma, congenital...B- 22
  xanthelasma...B- 18
 medical ophthalmology—age and sex, influence...B-130
  albuminuria...B-120
  aural disease...B-127
  brain, diseases...B-137
  circulatory system, diseases...B-124
  diabetes...B-121
  diphtheria...B-114
  erysipelas...B-112
  exophthalmic goitre...B-128
  filaria...B-112
  gastro-intestinal disorders...B-127
  headache and neuralgias...B-138
  herpes zoster...B-112
  leprosy...B-113
  lungs, chronic disease...B-128
  lupus...B-118
  malarial diseases...B-115
  measles...B-115
  menstrual disorders...B-129
  migraine accompagnée...B-139
  nasal disease...B-126
  nervous diseases...B-131
  neuroses, reflex...B-140
  odontalgia...B-127
  optic aphasia...B-136
  rheumatism...B-119
  streptococcus infection...B-119
  syphilis...B-122
  torticollis, spastic...B-126
  toxic substances...B-116
  trophoneuroses, ophthalmic...B-113
  tuberculosis...B-117
 optic nerve, diseases...B- 89
  atrophy, congenital...B- 89
  treatment...B- 90
  tumors—glioma...B- 90
    grape-like growth...B- 89
    sarcoma...B- 89
 orbit, diseases of the...B- 23
  aneurism...B- 23
  caries and necrosis...B- 29
  cellulitis and abscess...B- 29
  enophthalmos...B- 24
  exophthalmos...B- 23
  exostoses...B- 28
  foreign bodies...B- 23
  hæmorrhage...B- 24
  tumors...B- 25
 physiology—color-sense, tests.B-16, 107
  congenital cataract, development of perception in...B- 14
  muscæ...B- 18
  muscular insufficiency, test—"Parallax test"...B- 11
  ocular fundus, examination...B- 14
  ophthalmo-dynamometer, Alleman's...B- 11
  ophthalmometer, Leroy's...B- 11
  pupillary reaction...B- 12
  retinal impressions, intermittent...B- 14
  retina, peripheral light perception...B- 15
  test-types, Landolt's...B- 16
  visual angle, differences in...B- 11
  visual sensations, subjective...B- 15
 etina, diseases...B- 83
  abscess in hyperplastic retina...B- 86
  amblyopia, congenital...B- 83
  arteritis specifica...B- 88
  cysticercus...B- 85
  detachment...B- 83
Eye, retina, diseases, glioma in infant...B- 8
  pigmentary degeneration...B- 83
  retinitis pigmentosa...B- 83
    purulent, primary...B- 86
  retino-choroiditis...B- 86
  senile degeneration...B- 84
 refraction and accommodation...B-143
  accommodation and convergence, Randall's model...B-146
  accommodation, unequal...B-143
  bogenstreif—curvilinear reflection...B-145
  children...B-143
    hyperopia of...B-145
  lenses, bifocal, Gould's...B-146
    cylindrical...B-145
    toric or periscopic...B-146
  metamorphopsia, binocular...B-144
  mydriatics...B-144
  myopia and astigmatism...B-144
    and size of orbit...B-144
    hereditary...B-144
    symptomatic...B-144
  nomenclature...B-145
  optometer, Starr's...B-146
  prisms...B-145
  record-chart, Whitney's...B-146
  statistics...B-143
  test-apparatus, Landolt's...B-145
  test-types, Abbott's...B-143
  trial-frame, Chibret's...B-146
 sclerotic, diseases...B- 50
  scleritis, acute...B- 50
  sclero-ophthalmia...B- 50
 therapeutics...B-104
  antisepsis...B-104, 108
  cataract...B-107
  chloroform and coal-gas...B-104
  color-blindness...B-107
  conjunctival diseases...B-105, 106
  corneal disease...B-105
  ephedrine—pseudo-ephedrine...B-104
  epistaxis from mydriatics...B-105
  hot water in hæmorrhage...B-104
  iritic disease...B-106
  ointments—collapsible tubes...B-108
  ophthalmias...B-105
  routine prescribing...B-108
  sclerotic disease...B-107
  violet end of spectrum, effect on vision...B-107
 unclassified matter...B-111
  ante-mortem eye, appearance...B-112
  blindness, census classification.B-111
    preventable, diminution...B-112
  grant-earning system in schools...B-111
  simulated defective vision, detection...B-111
 vitreous, diseases of the...B- 78
  foreign bodies...B- 78
  vascular growths...B- 79
 wounds, injuries, and foreign bodies...B- 97

Favus, treatment...A- 54
Feet, fetid sweating...A-49, 55
Food as nutrient media for bacteria...L- 40
Frambœsia (Pian)...A- 47
Frontal sinus, diseases...D- 34
  abscess...D- 34
  cysts...D- 36
  ectasia...D- 35
  inflammation of...D- 35
  maggots in...D- 36

Galvanism in vegetable parasitic skin diseases...A- 57
Glottis, œdema, intubation in...G- 7
Glycosuria...K- 30
Goitre...H- 2
  diagnosis...H- 2
  treatment...H- 3

Hæmaturia, etiology and treatment...K- 23
Hæmoglobinuria, etiology and treatment...K- 24
Hair, identification of human...J- 7
Hare-syphilis...L- 26
Hay fever...D. 19
Hendon and Wiltshire disease of cows...M- 5
Herpes, recurrent...A- 47
  zoster...A- 6
    atypicus gangrænosus hystericus...A- 8
    ophthalmicus...A- 9
Hydrothionuria...K- 59
Hydroxylamin, in skin diseases...A- 51

- Hyperidrosis, treatment .... A- 49
- Hypertrichosis .... A- 28
- Hypnotism, in ear disease .... C- 41

- Ichthyol, in skin diseases .... A- 55
- Ichthyosis .... A- 13
  - follicularis (psorospermose folliculaire végétante) .... A- 13
  - infantile, severe .... A- 13
- Indicanuria .... K- 7
- Indigo-calculi .... K- 7
- Inebriety, morphinism, and kindred diseases .... I- 1
- Inoculation, preventive L-38, 40
- Intubation of the larynx .... G- 1
  - for foreign bodies in the larynx .... G- 8
  - in chronic laryngeal stenosis .... G- 7
  - in œdema of the glottis .... G- 7
  - methods of procedure .... G- 4
  - new instruments .... G- 1
    - Annandale's laryngeal catheter .... G- 1
    - Tascher's short tubes .... G- 2
    - Bleyer's tongue-depressor .... G- 2
    - Bleyer's tubes .... G- 3
    - Dennison's mouth-gag .... G- 3
    - Henrotin's mouth-gag .... G- 3
  - results .... G- 6

- Keratosis (ichthyosis follicularis) .... A- 13

- Larynx, diseases .... F- 1
  - carcinoma .... F- 10
    - laryngectomy .... F- 10
      - Fowler's artificial larynx .... F- 12
      - normal compensatory voice after .... F- 12
  - foreign bodies F-18, G-8
  - intubation G-7, 8
  - laryngitis, acute .... F- 1
  - leprosy .... F- 6
  - lupus .... F- 6
  - morbid growths .... F- 6
    - diagnosis .... F- 9
    - etiology and pathology .... F- 6
    - treatment .... F- 9
      - Scheff's curette .... F- 10
  - œdema .... F- 2
  - operations .... F- 10
    - laryngectomy—extirpation .... F- 10
    - statistics .... F- 14
    - technique .... F- 15
    - thyrotomy or laryngo-fissure .... F- 18
    - tracheotomy (*quod vide*) .... F- 19
  - paralyses .... F- 16
  - stenosis F-17, G-7
  - trans-illumination .... F- 33
    - Blänsdorf's diaphanoscope .... F- 35
    - Freudenthal's electric lantern .... F- 34
    - Voltolini's electric lantern .... F- 33
  - tuberculosis .... F- 2
    - etiology and pathology .... F- 2
    - treatment .... F- 4
- Larynx, trachea, and œsophagus, diseases .... F- 1
- Legal medicine and toxicology .... J- 1
- Lepra .... A- 34
  - etiology and pathology .... A- 34
  - treatment .... A- 37
- Leprosy, rapid spread of .... M- 7
- Leucomaines in blood .... L- 39
  - methylamine .... L- 39
  - plasmaine .... L- 39
- Lichen ruber—lichen planus .... A- 15
  - differential diagnosis .... A- 18
  - microscopical examination and pathology .... A- 20
  - treatment .... A- 19
- Living birth, proofs .... J- 12
- Lupus, treatment .... A- 54
- Lupus vulgaris, treatment .... A- 49

- Mastoid process, diseases .... C- 29
  - mastoiditis .... C- 29
    - Meyer's douche .... C- 34
    - Meyer's finger-protector .... C- 35
    - Meyer's mouth-gag .... C- 35
    - Meyer's ring-knife .... C- 34
    - operation for opening antrum .... C- 35
    - Trautman's sharp spoon .... C- 34
  - periostitis C-33, 37
  - phlegmon over mastoid process .... C- 36
  - skull, chronic emphysema .... C- 35
- Measles, epidemics of .... M- 5
- Medical expert testimony .... J- 1
- Melanuria .... K- 8
- Membrana tympani .... C- 5
  - artificial .... C- 5
  - perforation .... C- 9
- Membrana tympani, perforation, diagnosis .... C- 9
  - phthisis, membrane in .... C- 10
  - rupture .... C- 9
- Microbe, the .... L- 38
- Milk, ptomaine of .... L- 40
- Morning sickness and elongated uvula .... E- 12
- Morphinism .... I- 7
  - acute poisoning .... I- 9
  - in pregnancy and lactation .... I- 9
  - regulation and diminution .... I- 9
  - substitution for alcoholism .... I- 10
  - treatment .... I- 7
- Mycosis fungoides (granuloma fungoides) .... A- 40
- Myxœdema .... H- 8
  - complications .... H- 10
  - etiology and symptomatology .... H- 9
  - pathology .... H- 8
  - treatment .... H- 9

- Nævus pilosus, with pigmentary sarcoma .... A- 30
- Nasal cavities, anterior, diseases .... D- 4
  - foreign bodies and rhinoliths .... D- 15
  - fungi .... D- 15
  - hæmatoma .... D- 18
  - larvæ in (myiosis) .... D- 15
  - lupus .... D- 12
  - lympho-hæmatoma .... D- 18
  - obstruction .... D- 17
  - occlusion, congenital .... D- 16
  - osteoma .... D- 17
  - papilloma .... D- 14
  - polypi .... D- 12
  - rhinoscleroma .... D- 19
  - sarcoma .... D- 13
  - tuberculosis .... D- 11
- Nasal septum, diseases .... D- 20
  - abscess .... D- 21
  - deviation .... D- 20
  - fibroma .... D- 22
  - perforation .... D- 21
  - spurs of the .... D- 21
- Naso-pharynx, diseases .... D- 22
  - adenoid vegetation .... D- 25
  - naso-pharyngeal catarrh .... D- 22
  - new instruments and procedures .... D- 38
    - Bélin's cœloscope .... D- 38
    - Black's speculum .... D- 40
    - Blair's tongue-depressor .... D- 40
    - Brown's ecchondrotome .... D- 40
    - Corradi's pressure-plate .... D- 42
    - Cozzolino's lamp .... D- 39
    - Dessar's nasal douche-cup .... D- 42
    - Dionisio's palate-elevator .... D- 41
    - Foucher's polypus-forceps .... D- 13
    - Garrigou-Désarène's septum-clamp .... D- 21
    - Gleitsmann's electrode and forceps .... D- 41
    - Heryng's mouth-lamp .... D- 32
    - Hinde's palate-retractor .... D- 41
    - Hooper's snare and écraseur .... D- 41
    - Kinnier's scissors .... D- 42
    - Krakauer's curette .... D- 27
    - Potter's speculum and mechanical saw .... D- 40
    - Robinson's (Beverly) inhaler .... D- 42
    - Spence's illuminator .... D- 39
    - Vansant's tilting mirror .... D- 39
    - Von Klein's speculum .... D- 40
    - White's tongue-depressor .... D- 41
  - pharyngeal bursa, cysts .... D- 24
  - pharyngeal tonsil, supernumerary .... D- 22
  - post-nasal catarrh .... D- 24
  - post-nasal polypi .... D- 29
  - surgery .... D- 37
    - anæsthetics .... D- 38
    - antiseptics .... D- 37
    - cocaine poisoning .... D- 38
    - head-extended position D-38, 39
  - tumors .... D- 24
- Neck, fistule of .... F- 33
- Nose, anatomy and physiology .... D- 1
  - erectile tissue .... D- 1
  - olfactory nerve .... D- 2
  - turbinated bone, anomaly .... D- 4
- Nose and accessory cavities, diseases .... D- 1
  - reflex neuroses .... D- 30
    - eyes .... D- 30
    - œsophagus .... D- 31
    - nervous symptoms .... D- 31
    - sneezing .... D- 31
    - teeth .... D- 31
    - vasomotor .... D- 30
  - statistics .... D- 37

- Œsophagus, diseases .... F- 23
  - anomalies .... F- 24
  - carcinoma .... F- 32
  - dilatation .... F- 24
  - diverticulum .... F- 24
  - foreign bodies .... F- 26
    - œsophagotomy for .... F- 27
  - œsophagoscopy .... F- 28
    - Leiter's pan-electroscope .... F- 28
  - œsophagotomy .... F- 33
    - Berlinghieri's ectropœsophage .... F- 33
  - rupture .... F- 26
  - stricture .... F- 29
    - coarctation, with fistule .... F- 31
    - linear electrolysis .... F- 31
    - Symond's tubes .... F- 29
- Oliguria and anuria .... K- 2
- Onyorasia .... K- 9
- Ophthalmology B-1-112
  - medical B-112-146
- Opium, poisoning by .... I- 12
- Otology .... C- 1
- Otorrhœa (see Ear, otitis media) .... C- 15
- Oxynaphtoic acid, in skin diseases .... A- 50

- Parasitic (vegetable) skin diseases A-52, 57
- Pediculi pubis .... A- 57
- Pemphigus .... A- 33
- Peptonuria .... K- 20
- Petroleum soap, in skin diseases .... A- 57
- Phagocytosis .... L- 36
  - Toussaint's theory .... L- 36
  - Buchner's theory .... L- 36
  - Grawitz's theory .... L- 36
  - Metschnikoff's theory .... L- 36
- Pharynx, diseases .... E- 1
  - angina Ludovici, treatment .... E- 2
  - erysipelas .... E- 1
  - œdema, acute .... E- 1
  - pharyngitis, acute, treatment .... E- 1
  - retropharyngeal abscess .... E- 2
- Pharynx, tonsils, and soft palate, diseases .... E- 1
- Phosphaturia .... K- 48
- Phthisis, membrana tympani in .... C- 10
- Pian (Frambœsia) .... A- 47
- Piedra .... A- 44
- Pneumaturia .... K- 57
- Pneumonia, transmission to fœtus .... L- 28
- Polyuria, etiology .... K- 1
  - treatment .... K- 2
- Post-mortem phenomena .... J- 8
- Propeptonuria .... K- 21
- Pruritis, treatment A-49, 51, 52
  - senile, treatment .... A- 12
- Pseudoleukæmia cutis .... A- 45
- Psoriasis .... A- 15
- Ptomaines and toxines .... L- 40
  - ptomaine of milk .... L- 40
- Purpura hæmorrhagica, treatment .... A- 53
- Pyrocatechinuria .... K- 35
- Pyuria, miliary .... K- 60

- Railway spine .... J- 3
- Rhinitis, acute .... D- 5
  - atrophic .... D- 9
  - cholesteatomatous .... D- 4
  - chronic, simple .... D- 5
  - hypertrophic .... D- 6
  - membranous .... D- 5
  - syphilitic .... D- 10

- Salol, in skin diseases A-49, 55
- Scabies, anatomy .... A- 2
  - treatment .... A- 51
- Scarlet fever, epidemics of .... M- 5
- Sexual precocity .... J- 8
- Silver, nitrate, in purpura hæmorrhagica .... A- 53
- Skin, carcinoma of .... A- 31
  - diseases of nervous origin .... A- 46
  - exfoliative affections, losses suffered in .... A- 45
  - nerves of, distribution .... A- 47
  - sarcoma of .... A- 43
  - scirrhus of, primary .... A- 31
- Skin-diseases, classification .... A- 1
  - angio-neurotic dermatoses .... A- 5
  - chorioblastoses .... A- 34
  - epidermidoses .... A- 13
  - ideo-neuroses .... A- 12
  - inflammatory processes, simple .... A- 1
  - neuritic dermatoses A-6, 46
  - stasis dermatoses .... A- 9
  - syphilodermata .... A- 41
  - therapeutics .... A- 49
  - unclassified affections .... A- 44
  - xanthoma .... A- 42
- Small-pox, epidemics of .... M- 7

Soft palate......E- 11
  innervation of muscles......E- 11
  syphilis......E- 12
  tumors......E- 11
    adeno-chondroma......E- 12
    epithelioma......E- 11
    fibro-myxoma......E- 11
Sphenoidal sinus, œdema......D- 36
State medicine......M- 9
  compulsory notification of disease......M- 9
  quarantine and appliances......M- 10
    disinfecting machinery......M- 10
    "jacket" chamber......M- 10
  sanitation of ships and quarantine......M- 10
Sulphurous-acid gas, in favus......A- 54
Sycosis......A- 5
  bacillogena......A- 5
  treatment......A- 52
Syphilodermata......A- 41
  late erythematous......A- 41
  neuro-syphilides and neuroleprides......A- 41

Tattoo-marks, treatment......A- 54
Teeth and ear, relation between diseases of......C- 40
Telephone, injurious effect upon hearing......C- 39
Thyroid gland, diseases......H- 1
  anatomy and physiology......H- 1
  cachexia thyreopriva......H- 10
  hydatids......H- 6
  malignant tumors......H- 1
Tinea tonsurans......A- 52
Tobacco habit......I- 12
  acute poisoning......I- 17
  symptomatology and toxicology......I- 12
  tobacco angina and angina pectoris......I- 16
Tongue—hypertrophy of glands at base......E- 12
Tonsils, diseases......E- 2
  abscess encysted......E- 6
  hypertrophy......E- 3
Tonsils, hypertrophy, relation to physical development,......E- 3
    treatment......E- 4
  hypertrophy, with chest deformity......E- 5
  secondary lesions in tuberculosis......E- 7
  syphilis......E- 6
  tonsillitis, acute......E- 2
    phlegmonous......E- 3
  tumors......E- 9
    epithelioma......E- 10
    sarcoma......E- 9
Toxicology......J- 18
Tracheotomy......F- 19
  new instruments......F- 19
    Collier's dilator......F- 21
    Hildebrandt's retractors and hooks......F- 21
    Holden's divulsion set......F- 20
  occlusion of fistulæ......F- 23
  tracheotomy tubes......F- 22
Tuberculosis—infection from diseased meats......M- 6
Typhoid (enteric) fever, adventitious rashes of......A- 44
  epidemics of......M- 6
Typhus fever, epidemics of......M- 3

Ulcers......A- 49
  perforating, of elbow, following neuritis......A- 47
Urea, excretion and estimation......K- 39
Uric-acid diathesis, etiology......K- 41
  therapy......K- 44
Urinalysis......K- 1
  technique......K- 59
Urine—alterations in quantity......K- 1
  casts......K- 61
  chlorides......K- 50
  chylous......K- 36
  color and coloring material......K- 4
  cystin......K- 37
  gas in......K- 57
  incidental substances......K- 50
  micro-organisms......K- 55
  microscopy......K- 60
Urine, preservation of formed elements......K- 59
  ptomaines......K- 37
  reaction......K- 9
  specific gravity......K- 9
  technique......K- 59
  tests for—acetone......K- 35
    albumen......K- 16
    bile......K- 35
    creatinin......K- 48
    iron......K- 52
    mercury......K- 51
    peptones......K- 21
    phosphates (earthy)......K- 49
    potassium iodide......K- 51
    propeptones......K- 21
    pyrocatechin......K- 35
    sugar......K- 30
    urea......K- 40
    uric acid......K- 46
  toxicity......K- 53
Urochrome and derivatives......K- 5
Urticaria......A- 5
  capillary pulse in lesions of......A- 5
  chronic, varieties......A- 6
  pigmentosa......A- 6
Uvula, morning sickness and hypertrophied......E- 12

Vaccination......M- 7
  artificial vaccine lymph......M- 7
  human and animal vaccine......M- 7
  tuberculosis from animal vaccine......M- 7
Vidal's "red plaster"......A- 51

Whitlow, treatment......A- 58

Xanthoma......A- 42
  diabeticorum......A- 42
  multiplex planum tuberosum......A- 42
  treatment......A- 43
Xeroderma pigmentosum et atrophicum......A- 33

Yellow fever, epidemics of......M- 1

DEPARTMENT OF MEDICAL POLYTECHNICS AND SANATORY APPLIANCES.

TYPE-WRITING MACHINES.

THE invention of the printing telegraph, and its introduction into commercial pursuits, was probably the incentive to the application of a similar principle to the requirements of ordinary literary work and correspondence. Within the last few years, the use of writing-machines, or type-writers, as they are usually designated, has become almost universal. Business men have hastened to avail themselves of a method of letter-writing which is not only easier to read than hand-writing, but is easier to write; with increased legibility, there is a gain of nearly 100 per cent. in speed. Literary men, authors, copyists, and others who are required to write a great deal, find the type-writer a veritable boon; they can do better work in less time and with less fatigue than by the old (I had almost said, obsolete) method with the pen or pencil.

One great advantage possessed by the type-writer is that it employs both hands, instead of giving all the work to one side of the body, and, largely, to one side of the brain. The type-writer, therefore, acts as a preventive of that form of spasm known as writers' cramp, which is a neurosis dependent upon exhaustion of the motor centre in the brain. In fact, persons who are obliged to write very much, and who find symptoms of writers' cramp coming on, may prevent its further progress by changing their pen for a type-writer. Dr. Lincoln, a well-known writer upon hygiene, even says that "the temporary use of the type-writing machine will often prove a great boon, permitting a continuation of work while resting the affected muscles."

The demand that has sprung up for these machines in business circles has demonstrated their usefulness, and they are now regarded as indispensable for professional men as for merchants. In preparing manuscript for the printer, for instance, nothing could excel the clean, regular, and uniform writing of the type-writer. It also enables the author to "see how it looks in print," and he can make many of his corrections before the matter is put into type; it is thus a great saving of expense as well as of time. Pharmacists have begun using it to print their directions upon labels, which makes them legible even to a child, and may prevent mistakes by older persons. It has been suggested that physicians might utilize it with advantage in writing their office prescriptions. Certainly, any device that insures greater care in writing prescriptions, and greater legibility, will tend to reduce the percentage of mistakes, and is thus worthy of consideration.

The advantages of the type-writer to the medical man are so well enumerated in an editorial in the Journal of the American Medical Association that we venture to quote the concluding paragraphs* :—

"There are several reasons why medical men who write should use the type-writer. In the first place, as a matter of economy of time, and hence often of money. It is easily seen that there is a great saving of time with a machine that will do a piece of work in one-half or one-third the time that it can be done by hand; and this is easily accomplished with a type-writer. In the second place, the machine promotes accuracy, especially in thinking, for two reasons: being more rapid than the pen, the thoughts of the writer do not wander so far ahead of his work; and, should he wish to refer to what has been written, he can see it at a glance, as on a printed page. A third reason is, that the person who uses a type-writer sits erect, and can thus work for a longer time without fatigue than when bending over, as in writing with a pen. It is thus more wholesome than the pen. The machine, further, promotes accuracy in the printing-office,—a great source of comfort to writers; and it promotes a degree of accuracy on the part of the writer in that he will not make a wavy line, or two or three letters and an apostrophe, do duty for a long word, and his punctuation marks, if not more correct, will at least be more numerous.

---

* Journal of the American Medical Association, vol. vii, p. 22.

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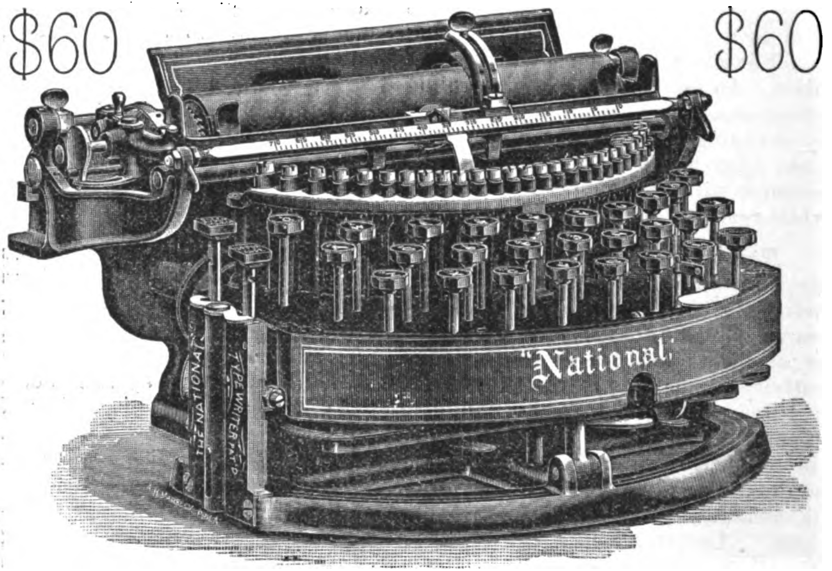

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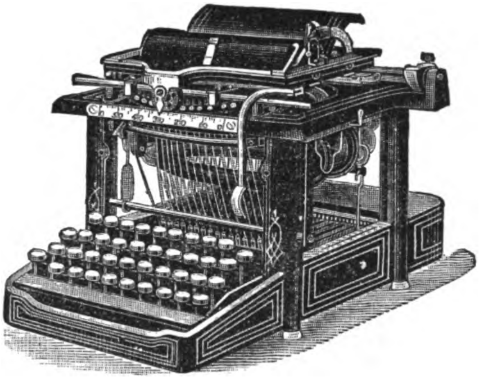

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ico-Psychologique, Paris, by Christian, who reports the morphine habit by immediate withdrawal in a patient rammes (46 grains) of morphine and 1 gramme (15 ocaine a day. Ball, Ritti, Briand, le Grain, Ballet, ho discussed this subject, spoke in favor of immediate Schmitt[826, Sept.] recommends codeia as a substitute for fter the latter has been reduced to a very small dose by withdrawal, the codeia is then gradually reduced. He ed meco-narceine for the same purpose. Stuart[2, Jan 11] re- re of a patient who took 40 grains (2.6 grammes) of morphia a day by hypodermic injection. It was nce, and hypodermic injections of $\frac{1}{100}$ grain (0.00065 ch of digitalin and atropine were given; amyl nitrite ed, and fluid nourishment with wine or whisky. The ymptoms were very violent; muscular spasm, insomnia, ls, cold sweats, hurried respiration, and rapid pulse. Calcutta,[3, Apr.10] uses cannabis indica combined with stro- lessen the abstinence symptoms after the withdrawal . Chouppe[3, Feb.6] has observed that persons addicted to ill tolerate doses of cocaine that would produce serious those who are not taking morphine. He does not one an antidote to the other, but thinks that the enders the cortical cells less sensitive to cocaine. s that a small dose of cocaine combats the effects of the rabbit. Peck,[235, June] writing from a mission in China, large consumption of opium antidotes used by the hile he condemns the misuse of these anti-opium pills, s own formula for a pill of this character, which he mission, and sells to the natives at 50 cents per 100. ade for him by Wyeth & Co., and labeled in Chinese, *hau.* The ingredients are: ℞ Sodii phosphate ex- grains (65 grammes); abstract nux. vom., 650 grains es); pulv. opii, 750 grains (48.6 grammes); triturate grains (9 grammes); abstract belladonna, 250 grains s); piperine, 500 grains (32 grammes); ft. in pil. no. pipe is forbidden, and the number of pills, commencing to 8, is gradually reduced, the majority of smokers leave off by the use of 100 pills or less.

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Drinker"[166] ex
whether she h